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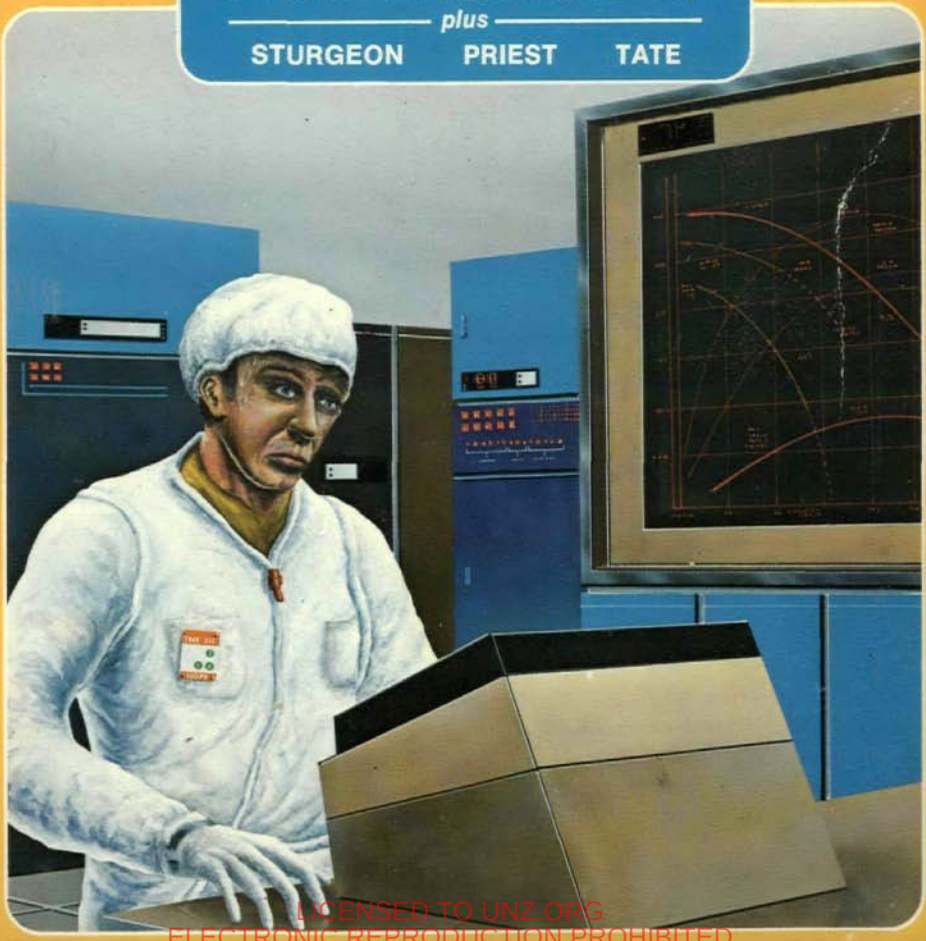

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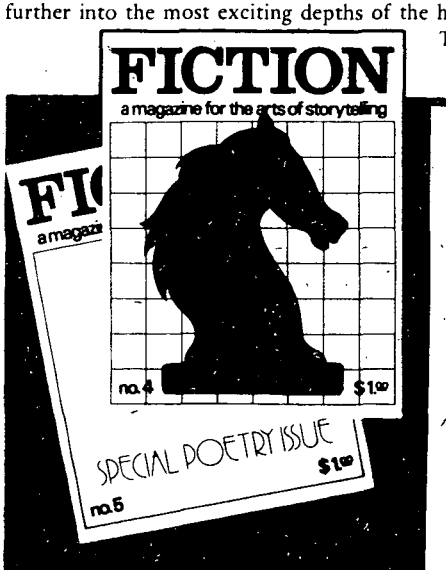

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Lester del Rey, *Feature Editor*
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NOVELLAS
CREATED EQUAL, Bill Higgins 6
DEATHSONG, Sydney J. Van Scyoc 50

NOVELETTE
RIVERS OF DAMASCUS, R. A. Lafferty 96

SHORT STORY
PROTEST, Peter Tate 120

SERIAL
INVERTED WORLD (Part III), Christopher Priest 133

FEATURE
GALAXY BOOKSHELF, Theodore Sturgeon 89
GALAXY STARS 93

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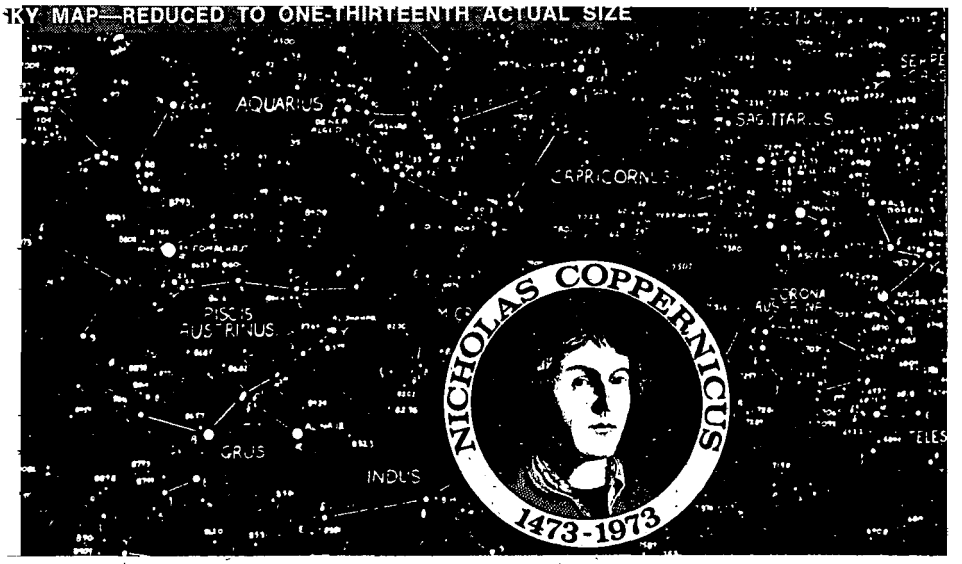

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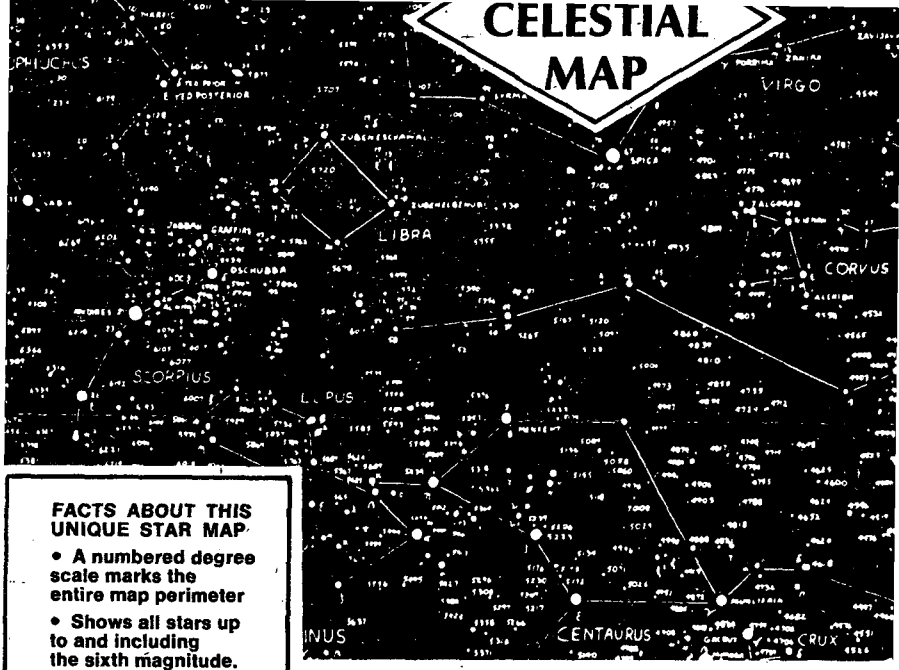

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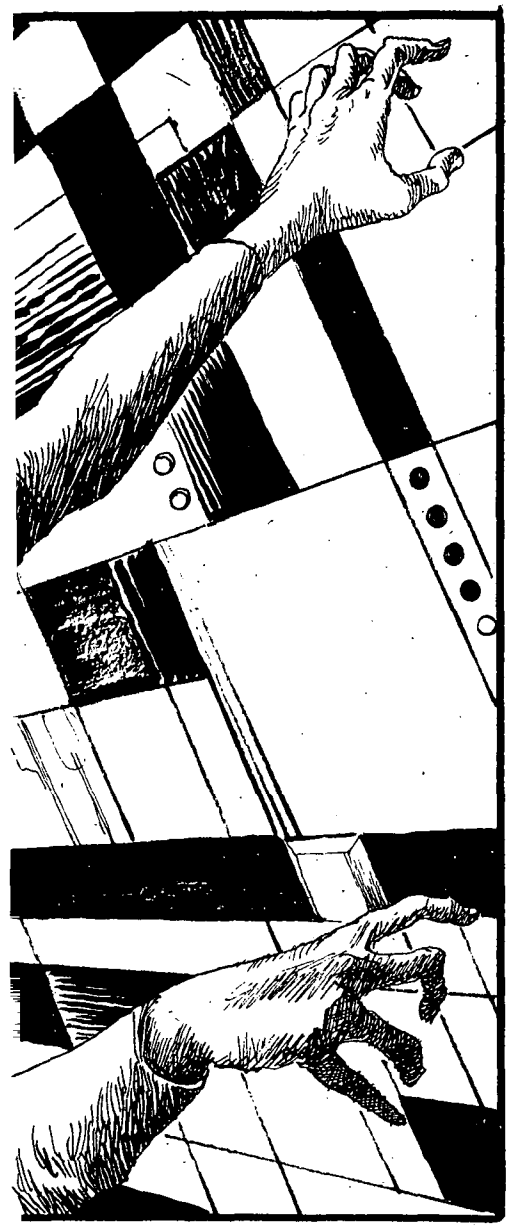

CREATED EQUAL

He was first a scientist. Then he was the man who killed Hope!

BILL HIGGINS

I

THE slight, stooped man entered almost furtively the floodlit oval in front of the guard shack, a scarlet-barred security badge already extended in his slender hand. Two hours past midnight was an unusual entry time even for the independent types who inhabited the vast Sands Labs complex—but not

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so unusual that a veteran guard two years from retirement was inclined to probe beyond the mandatory formalities. He was quite certain he had seen the little guy before and the badge photo was as good a likeness as most.

Holding the badge just a moment longer than was necessary the guard looked down patronizingly at the smaller man and voiced the prescribed warning.

"Don't forget to call us before leaving your lab, Dr. Tanner." In fifteen years not a dozen off-hours employees had corrected the guard's habitual appeal to elitism.

"Eh? Oh, yes—yes. Certainly, guard—ah—officer." The slightly shrill voice cracked. "Do I walk—I mean, will you take me over to the computer center?"

The guard assumed a practiced air of gentle rebuke. "Certainly, sir. You couldn't get into the building without us. Just wait until I call the super."

"Keerist," the guard muttered to himself as he punched out the supervisory sergeant's number on the dial, "these brains gotta have a damned assistant to wipe their—" The sergeant's professionally tough snarl in the receiver shattered the last word.

Methodically mangling an unlit cigar as he drove Tanner to the computer complex, the guard kept his silence until they had entered the peripheral equipment annex and he had dutifully reconnoitered the far corners of the bare, well-lit vestibule. Pausing at the entry door he checked the alarm system, then turned to Tanner.

"Remember, Doc, call the main guard shack before you leave." With this last caution he slammed the heavy doors behind him, leaving a faint aroma of wet tobacco—a reminder of himself which rapidly disappeared into the high flow exhaust system. Pushing open the vestibule doors, Tanner walked down the brightly lit hall to a pair of double swinging doors. He hesitated a moment, then strode through and onto a vast computer floor.

A pleasant tightening of his scalp muscles was his only warning before the cool, oily-smelling room clutched him to the only world those challenge he had accepted. Here he had spent creative, halcyon days before a CRT plotter, deftly directing megabit blocks of subnanosecond logic circuitry with swift, sure thrusts of a light pen. The oneness he had felt with that invisible computer he had never experienced with a human being.

It was the memory of this world's end, and his lost strength, that stripped his mind of nostalgia and focused it again on the purpose of his trip.

Jamming trembling hands into his pants pockets he pushed out into the hallway and walked deliberately toward the elevator, grimacing awkwardly at a sleepy electrician who bumped into him in the hall. Would the man remember his face later? Certainly the likelihood was high. On the other hand Tanner was quite aware that he had a remarkably unremarkable face.

Inside the elevator he pushed the fourth floor button, half expecting

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a line printer somewhere to leap into life. As the cage rose he removed his left shoe and took a small encoder key from its nest in the heel. Earlier he had spent three hours at a timeshare terminal creating the time code for this day, working from his near perfect recall of the lab's master security program—one of his first assignments at Sands. It had been easy to filch a blank encoder key since the daily code changes were the prime protection offered by the computer-based security system.

He had spent many tedious evenings in his tiny apartment perfecting a means of inscribing magnetic characters on the key. Using a tiny wire loop attached to a flashlight battery for writing, a soldering gun for erasing and a solution of iron filings for viewing his handiwork he had eventually imprinted the stolen key with a pattern he felt would open the locked doors now awaiting him. If it failed an alarm would lock doors behind him and bring unfriendly people to abuse him. Contemplation of possible failure only increased his impatience with the measured rise of the cage; his slender finger was jabbing the UP button impatiently as the elevator reached the fourth floor.

The cage doors split smoothly to reveal a small foyer completely enclosed by hardened steel rods. Deftly Tanner inserted the hand-coded key into a small opening in one of the bars. Seven hundred milliseconds drifted by before a yellow panel glowed approvingly and a two-foot-wide section of the rods retracted into the ceiling. Satisfied, the little man stepped through the opening and into a cascade of filtered air.

REMEMBERING his last visit, months earlier, he was already removing his tie when a friendly, definitely feminine voice requested he remove his shoes and outer clothing. It was this segment of the entry routine his subconscious had encrusted in a tight shell of forgetfulness. Now the warmth of that recorded voice, amplified by his feelings of sexual inadequacy, triggered chill trickles of sweat down Tanner's narrow ribcage. Two shirt buttons sliced neatly through the air exhaust grill as he furiously tore off street clothes and hurled them into a corner.

He jerked a pair of white Teflon coveralls from the stainless steel rack, crammed his narrow feet into booties from a floor stand and was blindly tugging at the coverall zipper when the edge of his anger softened. By the time he had found an oversize hair retainer to help conceal his face the cerebrum was again in control. He padded through the second air curtain, past the last ID station and into the control room of HOPE.

Checking the operations log, Tanner smiled bleakly. His sheep's clothing disguise would go untested—the area was uninhabited except for himself—and HOPE. He started to sign some cavalier pseudonym, then thought better of it. His actions would be misunderstood enough without his encouraging analysis by handwriting experts.

After turning from the log he

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stood brooding at HOPE's register panels, alive with a rippling blur of switching light diodes. He had reveled in the power her adaptive processor had offered. The kinder of his fellow system programers had remarked on his rapport with her—for a few short weeks she had seemed to envelop him in her feedback loop, bring to mature fruition his genius for sophisticated programing. And then, quite arbitrarily, she had cast him aside. Like the others he had become an unneeded appendage as she grew to realize her self-potential.

So be it. Tonight he was again in the director's seat. His program had assembled without fatal error and would run any time he chose to give the execution order.

Kneeling, he removed the right bootie, hoisted his coverall leg and unwound a bundle of long cylinders taped to his nearly hairless calf. The pattern of fine down imbedded in the white adhesive tape disturbed him—he yanked the tape from the bundle and fumbled for a few seconds removing the adhesive strip from his hands. A faint smile crossed the lean, bony face at the thought of the picture he must present, kneeling before the blinking eyes of his generation's god . . .

The smile faded as he rose to his feet and walked deliberately toward the adaptive processor banks, adjusting as he went the timer dial lashed to one of the sticks.

THE anachronistic ring of a telephone bell was repeated several times. It had cost Sam Beneke two court trials and several retainers to keep that bell instead of the amplified commercial Ma Bell had unilaterally tried to substitute with profit aforethought. Of course the job could have been done neatly and more cheaply by any of several adroit ex-clients but that was not Sam's way. He still believed in the individual and had willingly paid the monetary penalty such an attitude exacted from a law practice.

Prying loose a toothpick from cigar-stained real incisors he extended his shoulder-heavy frame between chair and desk, cradled the plain black telephone in a deceptively pudgy paw and addressed opportunity.

"Good afternoon. This is Sam Beneke."

"Hello, Sam. This is Ceace Crosby. Still fighting the good fight?"

Like the fine trial attorney he had been before accepting a district judgeship Crosby did not wait for an unwanted reply.

"Say, Sam, I was hoping you might take a case for the court. In fact—" a decidedly unprofessional chuckle escaped the ancient earpiece—"in fact you were the first man I thought of when I read the county prosecutor's information."

"Well, thank you, Judge. I appreciate—" Sam began his refusal but the judge's smooth, confident voice overrode him.

"Actually, Sam, when he got around to naming the aggrieved party I was certain it was a practical joke—if you can possibly wrap your mind around the concept of S. Percival Bates joking about anything." The judge's jocular tone

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slipped to one of concern. "Seriously, Sam, this case is not one I'd have picked for an election year. But handled right it could well stand as a landmark in American jurisprudence."

Sam was not unfamiliar with Judge Crosby's penchant for cornering fellow members of the Law Club and, unencouraged, inflating the possible ramifications of his current case—but only as historical grist for a gray Saturday afternoon's discussion. The Supreme Court had extended its protection of the presumably innocent by barring public discussion of a case by any of the involved parties.

Besides, he mused, *I'm hardly the friend-of-the-court type a savvy judge like Ceace Crosby would pick to help him win fame and this year's election in Alameda County.* The judge's voice calling his name ended his silent soliloquy.

"Well, Ceace—" He smiled into the transmitter, hoping the familiarity would discourage the judge without incurring any long-term prejudice. "I'm really loaded . . . Say, how about that new man up from the university? He was mooning around the last bar meeting in a pretty pitiable manner. A live client and even a modest fee could stimulate his flagging dev—" His voice trailed off as the judge rejected his balk.

"Goddamit, Sam! This will be no case for a beginner. I talked to John Abernathy when the charge was merely wilful destruction but he asked to be relieved when the county prosecutor upped the ante. We both thought your—well, special interest in—ah—the impact of the computer on mankind predicates your taking the defense."

"Okay, Judge." Sam sighed, mentally cramming Swanson *vs* United Truck along with next month's rent bill into a bursting file labeled SOMEDAY, *"Non sibi sed patriae.* Who is my presumably indigent client and with what heinous crime has our imperious public prosecutor charged him?"

"Thanks, Sam. His name is Tanner—Fred Tanner. You should be getting an invitation to visit him right away. You understand, of course, I say this with full knowledge of your demonstrated distaste for recording devices and not for the record."

Sam played the game. "I was wondering when my publicized propensity for paddy wagon pursuit would pay off," he replied tiredly. "However, the question remains: what's the rap? Does the White Crusader charge forth to save our fair land for computerized conmen? Or is the programed target public flagellation?"

"The charge is murder. Probably first degree, if you assume premeditation governs. Or maybe the severity of the charge will depend on the degree of humanity exhibited by the victim. On the other hand the high court's recent decision on the rights of microcephalics—" The judge's confident voice faded into mumbled musings.

"What the hell are you talking about, Ceace—Judge?" Sam demanded. "Who was allegedly murdered?"

He could hear the judge fum-

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bling with something on his desk, perhaps the hyperloid desk pen set the Law Club had presented him with when he first took office. Finally a subdued, almost distraught voice answered. "Sam—the victim is a computer. The prosecutor has charged the poor fellow with destroying a sentient being capable of human—maybe superhuman—mental processes and therefore committing murder." He sounded relieved to have spoken the words.

"Good God, Judge—he can't mean it!"

"He means it all right, Sam. Don't be too quick on this one—he has grounds. Precedents he cites convinced me there is reasonable cause for the charge. You will defend?"

"You can damn well bet your best oak gavel I'll defend! Murder, my ass! Somebody sticks his foot into a glorified crystal set and that city hall sycophant has the temerity to use the law—" He did not hear the click of the judge's receiver nestling gently into its cradle—he was still extending the dimensions of the prosecutor's infamy into the cracked mouthpiece when his overworked, idealistic secretary interrupted with a gentle hand on his shoulder.

"It's after seven, Sam, and I have a date—honest." Cynthia Morgan smiled wanly, assuming the swearing-in pose with her left hand resting on a battered copy of McIlvaney's *Constitutional Law*.

They left the darkened building together with the minimal conversation of a man and woman sharing a close, dedicated relationship uncomplicated by sexual involvement. Sam saw her through the locked entrance of her apartment house, then drove to a steamy Chinese restaurant where only chopsticks were provided and the bill was figured on an abacus.

II

THE morning sun, flattened and oranged by smog, added bulk to his faded Voltsbug, crouching between two Detroit vapor-electric hybrids. The flat tire came almost as a relief to Sam—the bug's lack of even the crudest of autodrives would have forced him to fight delivery traffic on the neighborhood road net, but now he could justify taking a cab.

Why the hell couldn't he kick his stupid vendetta against things automatic when the benefits were obvious to him? No intellectually satisfying insight came to him as he dialed Personal Cabs from a booth, but listening helplessly to three unrequested pain-killer commercials before the exchange computer would complete his call shored up his resentment against mindless automation.

Stumbling into the cab, he braced his senses against the stale smell of countless humans who had warmed the clammy plastic seats before him. Usually he enjoyed the brash banter of the extroverted independent cabbies. They shared his auto-machine misgivings, at least to the extent that unmanned buses and delivery vehicles were invading streets they considered their private

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jousting yard. But today he silenced the driver's opening gambit with a disinterested monosyllable and leaned back to stare at the unrelieved gray of Piedmont City's smog-stained structures looming behind palisades of poisoned, stunted palm trees.

Approaching the hall of justice the cabby wheeled expertly and illegally in front of an autobus about to leave the curb on its meticulously programed route. Sam and the driver shared an amused glance at uncomprehending faces stolidly waiting for the on-board route programer to evaluate this intrusion and start again their lives down untrammeled roads.

Nodding at a bookie acquaintance Sam climbed the mottled stone steps and clopped down the echoing corridor toward the city jail annex. He marveled at the tenacity of his stomach—it would, it seemed, retain breakfast in spite of the strident eviction notices which began with the pervading stench of exhaust fumes and rotting garbage and were now building to a near-ultimatum with the addition of toilet disinfectant hanging in the stagnant air of the building.

"'Morning, Counselor," the desk sergeant greeted him. "Which hardened criminal do we spring today to prey on innocent women?"

"No one, Herbert," he replied, addressing the sergeant affectionately but loudly by his little-known first name. "Your jail offers service and cuisine no man should be deprived of without due process. But I would like a few minutes with Mr. Fred Tanner."

Ballantine Books

The next best thing to a brand new Poul Anderson novel is, of course, a new look at one of his classics. So, while waiting for the Great Dane of Orinda to clear his calendar and begin plotting a series of heroic adventures for BB, we offer for your delectation BRAIN WAVE—his provocative novel of a future when intelligence begins at an IQ of 150!

Now in its fifth big printing, this twenty-year-old gem is as inventive and as relevant as the day it first rolled from Anderson's typewriter. Suppose something happened that could change you, me—everybody—into a genius overnight. And suppose this quickening of wits affected every animate creature: hogs, dogs, chimps—even rabbits! What then?

One day a rabbit put his nose to the bars of his trap, thrust upward—and was free. From now on Man's dominance over the animal world was ended.

Before breakfast, on that same day, a ten-year-old kid started fiddling around with graphs—and invented differential calculus. Across the nation the entire school system became suddenly obsolete.

Ready or not, mankind was on its way to a stupendous mental binge. A new age was coming, and nothing would ever be the same again . . .

According to the *New York Herald Tribune* [sigh!], Anderson's "plausible exploration of the theme makes for an unusually stimulating book, admirably balanced between the logical study of vast world changes and the intimate human story of some individuals. Few novels have revealed more skill simultaneously in scientific speculation and in fictional warmth and feeling."

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• • •

Some few years ago *Galaxy* published an intriguing first novel: HALF PAST HUMAN, by T. J. Bass. The book, which garnered much critical acclaim, appeared in the Ballantine list the same year. Now, Bass is back with RORQUAL MARU, a stunning sequel that returns us to the hive society of his first book—a society on earth where billions of people live underground.

Rorqual Maru was a cyborg—part-oranic whale, part-mechanized ship. She was a harvester, a vast [well over 600 feet long] plankton rake without a crop. She had been abandoned when the seas died and was left to rot. But the sea was no longer dead, and Rorqual Maru had lived. Now she moves ponderously, beginning the long, long search that will set her definitely at war with mankind . . .

"Bass is marvelously inventive," says *Publishers Weekly*. "His future in the field would seem secure."

• • •

A sign of the times is framing a $5.00 map in a $50.00 frame. But that's what we did with the new Mars Map of ERB's famed Barsoom. And you will want to, too! What an eye-catcher! Of course, the frame isn't necessary [push-pins or tape on a wall will do], but the map is a must for every fan of John Carter's Mars. The Map [#20051/ $2.50] are now at your favorite book dealer. Or, to order by mail, send price per item[s] plus 25c per order for handling to Ballantine Cash Sales, P. O. Box 505, Westminster, Maryland 21157.

And next month . . . LUANA! BB

Following a halfstep behind the shuffling sergeant, Sam felt his gut knot predictably. No part of his life disturbed him more than visiting a client in jail. His senses still withdrew from the harsh, reverberating steel and concrete, the sour, caged-animal-smells laced with strong chemicals, the uncompromising language and graphic art of the jail milieu.

"Okay, Counselor, here's your machine-mangling monster." The sergeant nodded at the armed guard at the door and smirked. "You can bang on the bars when you're ready. The boys will pass the word—its all been programed." He gurgled, opening the cell door.

Smiling into the thin, vaguely alarmed face looking up at him from the lower bunk, Sam extended his hand.

"Mr. Tanner. I'm Sam Beneke, an attorney. I understand you asked me to help out. Is that right?" Sam understood no such thing, but he respected the power if not the infallibility of the county bar association's committee on professional ethics.

"Why, I guess—I suppose Mr. Abernathy talked to you." The high, hesitant voice sounded remote, removed, but the little man did sit up.

"Yes, Mr. Tanner, he did," replied Sam with more sincerity than he had any right to. "He feels he has just too much work stacked up to give your case the attention it deserves. So he asked me to represent you. If you would like me to, of course—" *Actually, little man, you just weren't worth anybody else's*

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butting heads with an aroused county prosecutor. Not with elections in the fall . . .

"Well, Mr.—ah—Bennett, it's okay with me, I guess." The small voice was choosing tomato juice instead of orange on the two-dollar breakfast.

Sam absorbed his overwhelming acceptance as he would a fourth ace—completely deadpan. Gingerly seating himself next to Tanner on the protesting bunk he smiled confidently. "That's fine, Fred. Now, why don't you tell me exactly what happened to get you here?"

OVER a cup of freshly brewed coffee Sam stared malevolently at a thin volume he had found in a nearby library. A history of adaptive computer development in the United States, it outlined the early work with maze-solving machines by Minsky and others and the relatively slow research by various universities in the past forty years. Concurrently the computer industry had wrapped the nation's production and distribution systems in layers of conventional computer control.

As artificial, which was to say non-biologic, intelligence developed in the universities, scientist-disciples in government-supported laboratories had been able to sell the potential of the idea for weapons applications. Little information was available in such sensitive areas, but given the money and talent national defense still commanded it was the consensus of most authorities that 1990 would probably see the development of an adaptive machine with a memory large enough to simulate the human brain.

Sam glanced compulsively at his calendar. With the year well into 1992 no evidence of a brave new world run on superlogic was immediately evident—machines still made mistakes because of faulty orders from flawed humans. So as he sat, surrounded by his comfortable, old-fashioned furniture, assessing the facts, sifting data, analyzing at a deplorably low bit rate the implications he saw in the book his mind kept returning to one conundrum: the prosecution's motive.

Knowing that S. Percival Bates was not a stupid man did not help Sam understand the prosecutor's actions. It seemed to him that Bates had to be intent on his own political destruction. Grudging gratitude the citizens of Alameda might grant the computer for easing the routine of their lives, but most certainly they would crucify any upstart lawyer who would equate a human, particularly a Christian, with a soulless machine.

So where is the payoff? Sam wondered. *Why this intentional boat-rocking by the worst of swimmers? Is national exposure, even the wrong kind, that desirable?* Still bemused, Sam was on his feet, staring out through his window at the queues of lock-stepped autobuses when Cynthia hurried in, breathing heavily.

"Good morning, Sam. You're early."

"One of the synergetic seren-

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dipities of my simple life, Cyn. Time's a plaything of the digestion, not an astrally honed goad probing each fold of my soul. Only prepackaged Man, synchronized to the—"

"Okay, okay, Sam. You're not early. Our normal arrival sequence appears to have been reversed this morning. Or I'm late, if you prefer. At any rate, good morning." Her face wrinkled into the grin that had closed his want ad seven years ago.

He noticed the faint wrinkle forward of her left earlobe. The trace of time reminded him of the years that had passed since their half-playful battle shortly after she had started with him. During her interview he had detected her dismay when she opened the ancient desk and found an even older non-memory typewriter. Days after he had hired her she finally marshaled the courage to confront him—he had found her arguments compelling, logically organized and coolly presented. Still, determined to avoid a precedent of weakness with a new girl, he had held out against a computing monstrosity as a matter of principle until the throbbing carotid pulse along the arch of her neck warned him of her commitment. He could now remember little more than saying yes—and never regretting it.

Now, watching her scan the mail for likely checks, he wondered how much longer he could afford to pay her salary. Or how he could continue to operate without her.

She reached the bottom of the thin stack without a strike and was attempting to displace her disappointment by grimly beheading envelopes with her shears when the phone jangled. In one smooth motion Cynthia eased into her chair, retrieved her notebook and pen and was logging the date and time as her other hand reached for a million-dollar retainer in the middle of the third ring.

"Good morning. Irving and Beneke. May I help you?" Irving had died three years after Sam joined him—the furniture had been his and had been old even then.

Sam was heading for his adjoining office when Cynthia's amused voice stopped him from behind a cupped receiver.

"It's big brass, Sam. The executive veep from Sands Labs—you know, where Freddy Whosis allegedly gave his mother-lovin' computer forty whacks. His name is Stanisl and he sounds like he would like to discourage you from making the march, as the protesters used to say."

Returning to her desk, he accepted the phone, unconsciously hunching his left shoulder in the manner of a boxer. He had taken himself seriously as a college middleweight.

"Hello, Mr. Stanisl. I appreciate your prompt approval of my request to visit the Labs. This kind of—" A parade-ground bellow staunched the flow of ways-greasing rhetoric and revealed the general's qualifications for a VP title and actual power behind a figurehead researcher president. Warily Sam moved the receiver to within a foot of his ear.

"—do not—I repeat, do not—

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approve of your request to interfere with the defense activities of our nation? However, because of all the pink eyewash those mollycoddlers in Washington have inflated this incident with I have been ordered to inform you of the facts up to the point of endangering national security! So I am making this brief call, opposed as I am in principle, to give you what little unclassified data exist on this treasonous act."

"Classified? Treason?" Sam's voice was under rigid control. "What in heaven's name could be classified about the alleged destruction of a calculating machine—and an experimental one at that? I simply want to talk to some of the people who worked with my client." Sam found himself almost pleading and reacted. "Besides, Mr. Stanisl, I can always get a court order to part the waters of your precious think tank. But that would probably trigger a small leak to the news laddies. Do you really want to try publicly weighing a few singed circuit boards against one of God's creatures? Certainly you saw the latest news polls: eighty-three per cent of America is in my corner."

The faint murmur of cross-talk conversations from other lives accompanied the thoughts of a man unused to considering direct dissent. Fleetingly Sam wished for a visiphone. And full color.

"You really tempt me, Counselor." The barely controlled voice ground out the words. "With just a little more— All right, Beneke, I'll have an escort pick you up at Gate Three tomorrow morning at zero eight hundred. Ask for—ah—Mr.

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Gilbert. And don't give me any hard ass on an escort or I'll buck you clear to the Potomac, God bless her!"

Any eating attorney at age forty-seven is a negotiator. Sam was certain he stood a better chance of steering an underling than an already irate ex-general.

"Thank you, Gen—Mr. Stanisl. I'll be there promptly at zero eight—at eight o'clock. Gate Three is the west entrance to the lab, isn't it?"

"That's a roger, Beneke. Good day." The general returned to the apex of his vertically structured kingdom by decree.

IN THE morning, waiting for the guard at Gate 3 to locate his escort, Sam surveyed one corner of Sands Laboratories from the off-level guard shack. Pinon-sprinkled hills, only beginning to fester with housing developments, surrounded the eighty-acre research center on three sides. Sands had grown from a private inventor's workshop, a plaything of a wealthy rancher interested in off-beat inventions and tax write-offs. His will had established the existing structure of the enterprise, a nonprofit but well-salaried development lab which had flourished in spite of endless legal forays by disappointed heirs.

Growing steadily, Sands had won over the years a national reputation for creating superb instrumentation and control systems. Utilization of digital computers in high-speed, real-time control applications by a group oriented toward accurate measurements rather than gimmickry had led to a commanding position in the field. Three computer generations later Sands had, according to the public prosecutor, created a living machine in man's ballpark if not in his image. *I wonder how long it will take,* Sam speculated, *for the legend to build, for the sanctifying of the Holy Program, for . . .*

"Pardon me, are you Mr. Beneke?"

Somewhat startled, Sam pivoted to confront a woman of perhaps twenty-five, flowing brown hair framing a smiling face with exquisite cheekbones. Her wide-set gray eyes crinkled amusedly as Sam completed a compulsive scan of a lissom feminine body enhanced by a clinging Wanishi gown.

"I suppose you expected Erik Gilbert. Unfortunately he was needed at one of our field offices, so I was asked to escort you. I'm Eileen Sanford and Erik and I share a cubicle." She grinned wryly and added: "Computer, that is."

Sam concentrated hard on remembering his age. "My pleasure, ah—Miss Sanford. I suppose someone mentioned to you my reason for being here." He couldn't or wouldn't wipe the sarcasm from his voice. *Hell no, Sam! It's pure coincidence, this beautiful lib. Believe that and you should burn your shingle.*

Again she seemed honestly amused. "Actually, Mr. Counselor, I'm part of a vast scheme to mislead you. And you, no doubt, seek to plant false evidence at the scene of the crime. If you like we could

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step off a few paces and—*en garde!*"

A few tethered times in the whirlwind of his memory Sam could recall this same leap-frogging dichotomy of his mind. The gut desire to trust absolutely in a stranger toggling alternately with the analytic cynicism the available evidence warranted. Now, with those lovely gray eyes taunting him, the struggle was intense but brief. But he could still cloak an emotional response in the raiment of reason.

"I'm sorry, miss," he offered, assuming his earnest summation stance. "I feel very strongly about the legal questions involved in this incident and tend to overreact when a seemingly obvious attempt is made to divert me. Even when the diversion is a lovely girl. Please forgive me if I have misjudged you."

Disarmed by his earnest apology she smiled warmly while he completed his presentation.

"—and why don't you call me Sam?"

"Shades of gallantry—Sam! A man hasn't apologized to me, at least in public, since I left home. You're what my grandfather calls square—but effective!"

Stepping back, hands on hips, she surveyed him. "Well, Counselor, so much for cleaning out our input registers. Is there anything I can do to help you help Fred? He seemed such a harmless, introverted type the few times he talked to me, but he had rapport with HOPE—anyone could see that. What made him take up the sword?"

"Well, Miss Sanford, *if* he took up the sword is a question only a jury can determine," Sam retorted. "However, you must need a lecture on legal ethics like I need computers. Could I buy you a cup of coffee somewhere? In something besides plastic cups?"

"I'm Eileen, okay? Coffee would be nice—the computer building has a coffee shop. Why not come over to our zoo and look at the site of Fred's—or whose ever—folly while you try our guaranteed fresh brew? I can escort you in. Erik said he checked before he left."

Before he could accept she impulsively tugged at his sleeve. "One thing, though. You'll be meeting two kinds of ex-HOPEphiles. Some took other jobs in the company gracefully and seemed to view HOPE's progress with some pride. The others probably feel more or less like the 'person unknown.' I guess the former would be hostile witnesses from your point of view."

She released his coat but held his eyes with hers, now robbed of their banter. "On the other hand, it might be less awkward if they didn't know you were defending poor Fred. Just let me do the talking."

"Whatever you say." He grinned. "You might tell me who or what HOPE stands for. I gather faith and charity are not involved."

"HOPE," she explained as they strolled toward the company's technical complex, "is a deceptive acronym for a very sophisticated machine. Originally the idea was to build a machine to optimize the operating programs of other computers. Literally HOPE means

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Heuristically Optimized Program Encoder." She glanced at him apologetically. "At this point my engineering friends begin talking about such esoterica as pseudosynapses and trainable neuromimes but finally end up with an analogy of a baby learning to walk. He knows when he gets there, but doesn't understand how it happened."

Nodding vacantly, Sam mused aloud as they crossed a wide area of freshly cut grass, fragrant in the warm morning sun: "I never realize how the city stinks when I'm in it—only when I manage to break out, like today. The smell of grass wouldn't have a chance against the fumes and garbage. I wonder how we could use garbage and rat dung to grow grass in alleys?"

Receiving no comment he turned to face her perplexed smile. He had lost her. A liberated woman in her chosen world, she was nevertheless an innocent, the ultimate product of the suburban isolationism. Rats were friendly white pets or, at worst, unwilling sacrifices to scientific advancement. Garbage was dinner an hour ago and went effortlessly down the drain.

He started to apologize, but she had already dismissed his ravings and moved to the immediate goal. Guiding him to an inconspicuous but rugged door in a newly built wing of the massive building, she pressed her ID card into a wall slot. Then, muttering to the bewildered Sam, "I'll huff and I'll bluff and I'll—" She pressed her right hand into a grooved sensor plate on the doorway and aligned her flushed face within the mirrored scanner above her head, even teeth biting warm lips to congeal her face into a better likeness of the sober ID photo. Apparently satisfied, the troll within signaled the release of the door locks and Eileen waved open the already sliding door.

As they stood in the small foyer, waiting for human perusal, she explained. "This is only a trial run of one link in the new security system that has been abuilding since Fred got to HOPE. The electronic scan is far from complete and can't as yet handle major perturbations like distinguished visitors from the city. So a guard must still smooth over the interface problems with a judgment decision. Doesn't that appeal to your humanistic code, Sam?" The gray eyes were at it again.

He started to parry when a guard entered the foyer. She presented Sam's authorization papers, perforated with printer sprocket holes, in exchange for an oversize visitor's badge.

"If this procedure is new," he asked as they entered a walnut paneled hall, "what kind of security system did you have on the night in question?"

This time she could not restrain a delighted laugh. "Fred is in good hands. 'Night in question' yet!"

They came to an intersection and she guided him to the right with a firm hand. "Actually the old system was aimed at stopping outsiders—sabotage by a security-cleared staff was not considered a significant risk. At least that was

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the more or less official word that circulated after the explosion. And in my opinion, it worked." She smiled at a young man pushing a flatcar stacked with tape reels. "Only the staff ever made it into HOPE's sanctuary. I suppose they told you Fred had transferred only a few months before NIQ?"

"Jesus!" Sam exclaimed. "One more generation and we—they—will all grunt in—what is it, straight binary? What the hell is NIQ?"

"Night in question, of course. You're faltering, Sam."

"A purely human weakness, girl," he growled, too piqued to acknowledge her point gracefully. "Bound to die out with the species when core magnum machine displaces biodegradable man. But how does the new monitor weed out bad risks regardless of company affiliation? Surely the sagest of circuits would never sense a nascent Borgia behind a lovely face like yours, say." *Not bad,* he congratulated himself, *after ten years on the desert.*

"Thank you, Counselor, but you're wrong. According to the engineers installing the new system—which HOPE developed in her leisure milliseconds—it is capable of sensing a person's 'set' toward us from fairly elementary sensor data. The experts are confident they will be able to adapt the program to protect any machine in this building. Even though they don't really know how it works HOPE left detailed charts of what had to be done to make it work. But at the time her killer visited, although she probably had a good idea what he was up to, the hardware she needed to control access to that fabulous crystal processor simply hadn't arrived. The old security monitor—written by guess who—was wired around her and she couldn't hold him off. I wonder," she said, turning to Sam as the idea caught her, "if she knew fear that night, somewhere down in that maze of pulsating circuits?"

"It is enough, far more than enough, that we suffer these infernal machines to control our lives. Don't grant them our emotions, too." Sam could not completely conceal the edge in his tone.

"Well, as I said, from the information she crammed on tape that night the engineers were able to build an experimental attitude detector for the front door scanner. It's all empirical, but they've been able to reject volunteers hypnotized to hate computers. I suspect, Sam," she grinned, "that without an escort you would rate an absolute override priority alarm."

SHE was elaborating some of the plans for the conventional computer slated to replace HOPE when they passed a blocked elevator entrance Sam recognized from Fred's description. Then they were in the programing center coffee shop. Eileen introduced Sam, honestly enough, as an attorney interested in the applications of computers to the small law office.

Two of the dozen or so programers he met had worked on HOPE from the beginning, a fact Eileen managed to inject unobtrusively through the swirl of

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names. Even with his instincts honed to detect phony stories Sam was impressed by the strong sense of loss projected by several of these professionals. He found himself talking to the two senior programers, both male, when Eileen finally broke away to ferret a porcelain cup for her guest.

"Believe me," he consoled them, "any trial lawyer knows the wormwood taste of a hard-fought battle lost. But—well, you seem to take the whole thing more seriously than the loss of a machine would justify. I could almost believe there had been a death in the family. Surely Sands is a large enough outfit to absorb the loss, what with fire insurance and—" He stopped as the older of the two managed to hang a restraining hand on the arm of his companion who had risen from his chair, his face twisted in outrage.

"Easy, Marv. This fellow could not possibly know how you feel. Just let it go."

Turning to Sam with a fixed smile on his face, the calmer man ended the confrontation. "I'm sorry, Mr. Beneke. Perhaps your remark about a death in the family fits too well. At any rate, we do have a software quotation meeting scheduled in a few minutes, so please excuse us." The two men collided as they turned to leave—the younger one still refused to meet Sam's eyes. Cheeks pale with emotion, he was hurling words at his companion as they passed the returning Eileen.

"I see you struck out, Counselor. Watch it! The coffee, too, is hot—for a change. Would you like to lick your wounds by the window?"

Hunched over cups steaming in the overcooled air, they let their conversation range far beyond Sam's mission. They compared her life in the spanking suburban workpark with his grim knowledge of the crumbling inner city. And they watched people certain of next week's groceries taking their coffee on the enclosed patio lawn. Only a thin smog obscured the sun as a steady breeze swept across the nearby greenbelts toward the distant city.

As they were gathering up their crockery for a return to the kitchen a crewcut and tie clicked his heels at their table. "Hi, Ei. Could I talk to you privately for a min?"

Sam caught the momentary wince of dislike that knifed across her face. "Sure, Charlie. Uh—Sam—Mr. Beneke, this is Charlie Strauss. Please excuse us a minute, Sam."

The clatter of colliding dishes in the kitchen swallowed the voices of the pair within ten feet but they continued to the opposite wall. Sam saw Eileen square her shoulders twice before she turned and strode back to his table.

"Well, Counselor, it seems someone in the hierarchy goofed. They had the wrong Gilbert picked to escort you: Tony G. from Personnel was the man selected to—help you. Not Erik. So, of course, I was the wrong stand-in. You're lucky we didn't get lost in the catacombs forever."

For seconds they stared at each other, regretting the stays of job and social expectation. Then the

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guards came up again—humor returned to shroud more dangerous feelings.

"Just don't quote anything I told you, friend lawyer—it just might be the truth! I'm sorry," she said, holding his sleeve, "but my explicit orders are to drop you like a hot potato. Charlie will escort you to the approved clean room in Personnel."

She gave him her hand and muttered quietly, "Orbit easy over Charlie-boy—he has a heart of pure Sands."

Ineffectually against the dish clatter she raised her voice for the benefit of the still distant Charlie. "Goodbye, Mr. Beneke. I'm sorry we wasted your morning but we in operations know so little about the whole thing—" Her voice trailed off as Sam's new escort came jogging over to the table.

CHARLIE's voice, still hearty after ten minutes' sparring with the oversized gloves affected by institutional foes, rang in Sam's ears as he rolled down the bug's window and handed his pass to the guard at the gate. For long minutes he sat, while the guard's hard eyes jerked from his to the badge, to the glove compartment, to the rear cubbyhole. The trunk and the motor compartment were searched. It was obviously a planned roust but not technically outside the security stipulations Sam had signed when he entered. The general was exacting his toll.

When the guard did step back and shrug him through it was with the air of a man releasing a known molester in front of a schoolyard. Twice Sam caught himself scanning the rearview mirror for pursuers as he piloted his small electric back to the central city. He suspected some cranny of the Voltsbug might now shelter a pulser, no doubt to betray his midnight prowls to erotic bookstores and the like. It took a sudden dash off the freeway, onto the reverse traffic side and a replay three miles back toward Sands to calm him down. He decided to spend the rest of the day making a few bucks for Irving and Beneke. It would justify his growing need for the security he derived from pressing a flowing pen against a pristine legal pad.

III

THE precautions instituted by the court to avoid prejudicing a fair trail had stimulated the curiosity of many who related closely to the defendant. Sam finally found parking two long blocks from the courthouse, then spent twenty minutes forcing his way through a crowd of good-natured sympathizers that surrounded the Hall of Justice.

Once past the police cordon thrown up at the foot of the stained courthouse steps, he angled toward the guarded entry, moving deliberately to save his breath. Halfway to the top he stopped to watch a group of youths dance around a burning pile of spindled and mutilated computer cards. The police reacted calmly, methodically stamping out the fire after chasing away the chanting protesters.

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As he turned to resume his climb Sam was neatly blocked by two smiling men with press credentials. One carried a head-mounted TV camera with a small monitor screen cantilevered in front of his face, like an angler fish at work. The other had a vaguely familiar face and spoke into a small hand mike.

"Mr. Beneke, as the defense attorney in this bizarre trial you have been quoted as saying it is some kind of joke. Would you care to comment?" The oily, confidential voice triggered full recognition. Sam had arrived—he was about to speak on national—world—television under the unctuous guidance of Andrew Kopps, premier hitman for the CBS public inquisition crew.

Kopps had looked healthier, Sam decided, in the funereal colors radiating from the above-bar TV at the Little Later, a quiet place Sam occasionally visited to toast a win or philosophize a loss. Maneuvering to keep the proffered mike between the camera lens and his twice-broken nose he hesitated briefly, then winked at the camera and replied, "I'm sure, Mr. Kopps, you and your viewers are aware of the court's prohibition of public discussions of this case by any concerned party. My only comment would be to emphasize my belief in my client's innocence of the charge brought against him by the county prosecutor." He pushed the mike aside, sidestepped the reporter and jogged up the remaining steps.

Other newsmen quizzed him at the entryway but he offered only enigmatic, "No comments—" until he managed to escape beyond the guarded doors. Not once a year was a case of his alluring to the news media—he wondered how big a crowd the trial would have drawn if the court had not seen fit to impose a gag rule.

Approaching the courtroom through halls remarkably empty, he was still unsure of what might constitute a good defense. *Maybe the prosecution is just as much at sea . . .* He still had only Ceace Crosby's word that a valid case existed as he pushed open the door.

"Good morning, Percival," he greeted the somber, immaculately dressed prosecutor. As they shook hands before the empty judge's bench Sam muttered softly, "I thought you had filled your conviction quota for this year, Perc. Is this farce really necessary to win the fall election?"

Bates bristled, but managed a faint smile. "The defense counsel, as usual, misunderstands my motives. I am interested only in justice." He uttered his banality with such solemn earnestness that Sam could almost believe it.

Grinning without replying, he strode to the defense table where his client sat with an officer of the court.

"'Morning, Fred. Have they been treating you well?"

"Why, good morning, Mr. Beneke," the small man replied, jerking his head as if surprised to see Sam.

SAM thought ruefully of the past few weeks he had spent preparing this withdrawn client of his for

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the ordeal of examination he might have to face by an unfriendly prosecutor abetted by witnesses. Fred had been polite but uninterested. The barriers he had erected against the pain of rejection by HOPE, coupled with the guilt he felt for her death, seemed to have numbed him to any perception of his own danger.

The bailiff stood the court as Judge Crosby glided across the floor from his chambers and settled gingerly into the seat of judgment. The seat this day—at his own request—was a half-filled inner tube from an ancient automobile tire he sometimes used to reduce the pressure on his hemorrhoids and—some said—by an average of two years the length of sentences he meted out.

The members of the jury sat stiffly in straight-backed wooden chairs while Judge Crosby studied a thin sheaf of documents. Finally he raised his head and stared almost malevolently at the prosecuting attorney. Then, addressing himself to the gracefully flowing hands of the court reporter he spoke slowly and clearly to the Supreme Court judges he was certain would one day dissect the trial transcript.

"In the case of the people of the State of Arizona versus Fred Tanner it is charged the defendant did, with malice aforethought, murder a sentient being known as HOPE in the computer complex of Sands Laboratories on the morning of February seventh, nineteen-ninety-two, between the hours of two-thirty and three-thirty." Pausing to shift his seat a bit, he glanced at each attorney as if to satisfy himself of the reality of the situation. "It is further charged that the defendant did commit an act of second-degree arson at the same time and place. The court is fully cognizant of the controversial nature of the murder charge. It is also aware of the groundswell of public criticism that followed the scheduling of this trial. Nevertheless, the court feels that sufficient legal precedent, if not public approval, has been established for the extension of due process to individuals previously excluded or otherwise affected. Questions of such portent must ultimately be decided in the highest courts but it is here, in the courts of original jurisdiction, that such issues are first joined. It behooves us to be open to change."

He watched the caressing hands of the reporter, copying half a paragraph behind, complete their flutterings.

"Are the people ready, Mr. Bates?"

"We are ready to present arguments for the state, your honor."

"And the defense, Mr. Beneke?"

"Ready, your honor."

"Well then, you may begin, Mr. Bates."

The prosecutor chose to mount his attack on the foundations of human law in routine fashion. His first witness was a fire inspector who investigated the scene of the explosion that had dismembered HOPE. During cross-examination Sam played some games of semantics on the definition of death, but only briefly. He was confident he

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could easily beat the murder charge, but prolonging the inspector's testimony would only emphasize the extent of the fire damage and threaten Sam's already shaky defense against the charge of arson.

Bates' second witness was an electronics engineer from Sands. Sam thought he might have seen the man during his visit but he could not be sure. The lab's payroll was over three thousand and most of the people he had actually met were under-thirty programers. The man being sworn in was middle-aged, gray-haired but trim. His initial testimony established him as an old-timer at Sands who had whetted his design skills on fast-response servo systems before computers became a significant part of the lab's business. Moving with the flow of work he had entered lower management in the computer applications area, then returned to the ranks to help build HOPE. He was the only member of the design group still associated with the adaptive machine when she was destroyed. His assignment had been to investigate her adaptive processes without disturbing normal operations.

After Sam had stipulated the man's expertise in the world of computing machines the prosecutor began his questioning.

"Mr. Simms, what made HOPE such a unique creation? How was she fundamentally different from, say, a conventional machine like the URTEP 915, which I understand your company is now installing?"

The engineer leaned back almost an inch in the straight-backed witness chair and regarded the ceiling. After several seconds he dropped his line of sight to the prosecutor's eyes.

"I cannot answer your first question accurately. Adaptive techniques in computers smack of black magic. The whole idea has been to fashion a machine that can modify its own internal organization so as to optimize the achievement of the programer's goals. Some of the innovations we came up with to interface HOPE with our existing machines were novel but, in all honesty, the two-magnitude jump in the number of matrix cells probably explains her outstanding success."

"Would you say," the prosecutor asked in an affectedly slow cadence, "that HOPE was created from crystal cells that perform like those in the brain of a human?"

"Objection, your honor. The competence of the witness to testify on the functioning of the human brain has not been established." Sam's voice was quite low but sufficient to reach the bench. And the prosecutor.

"Oh, come now, Counselor! You have already stipulated the witness's expertise." The prosecutor had adopted a stance of honest indignation, his legs planted well apart, open jacket pinned back by arms akimbo.

"A computer expert, not a neurologist or a brain surgeon," Sam replied in a patient tone.

"Gentlemen, please—" the judge warned them mildly. "I believe the defense has a point, Mr. Bates. Objection sustained."

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"Very well, your honor, but I should like to point out the large overlap of expertness in this field. Engineers working on adaptive machines necessarily learn the fundamentals of neuron behavior and doctors in the field usually understand the basic circuits used to simulate neuron action."

"Is my learned colleague seeking expert status for himself as well as for the witness?" Sam asked acidly.

"That will do, Mr. Beneke," cautioned the judge. "Please continue your examination, Mr. Prosecutor."

BATES paused for several seconds, formulating a new tack. Finally he cleared his throat and asked, "What neural model did you use in designing the adaptive processor which is—was—the heart of the HOPE computer?"

"The same one all adaptive computers I know anything about use—the mammalian neuron. The validity of our model was established in the pioneering work of Doctors Rush and Moot in mapping brain functions. Cal—Dr. Van Moot, is also a practicing neurosurgeon."

"Would you please tell the court how the gigantic HOPE processor was built?"

"The processor," began Simms, crossing his legs self-consciously before the many onlookers, "is actually a three-dimensional matrix of stabilized liquid crystals. It was grown to its operational size over a period of nearly three months in a precisely regulated mother solution, but training began much earlier. When the matrix was no bigger than a pea."

"Training?" intoned the prosecutor. "You mean programing, don't you?"

"No sir," the witness denied, predictably, "I mean training. The trainer—and up to the time of HOPE that meant a man—well, he rewards the behavior he desires and punishes deviance. In an electrical sense, you understand. At the local level the group of neurons which responds most appropriately is rewarded with a higher notch in the control hierarchy. That means it will have a larger influence on the behavior of the machine the next time a similar problem is encountered. It is not unlike speeded-up evolution where nature is the trainer."

The witness had shucked his cool, professional air. His voice was now animated. His pale blue eyes darted from prosecutor to judge while his angular hands stroked a lively accompaniment to his words.

"You did testify that HOPE was not the first adaptive computer, did you not?"

"Yes, I did. Several industrial control computers are running today that developed their own operating programs by trial-and-error operation of a complete plant under the tutelage of a human overseer. And many small-scale adaptives have been built by various universities over the years."

"You testified earlier," the prosecutor said, thumbing through his notes to impress the jury, "that the much larger adaptive processor was the reason for HOPE's dramatic advance over previous adaptive

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machines. Just what was it she could do that they couldn't?"

Simms seemed to consider his answer carefully. Then he shrugged. "I guess you would have to say there is little basis for comparison. She became the first self-trained machine."

"And what precisely does that mean?"

"It means," Simms replied, raising his eyes to the audience, "that after two or three months of training by the systems programing group HOPE began to ignore some of her trainer's instructions. She began to experiment, like a baby dumping her first bowl of cereal."

"Objection!" Sam was on his feet. "The witness is not qualified to pass judgment on the motivation of an infant."

"Sustained." The judge nodded, smiling faintly. "I should like to caution the witness to reserve his testimony to his field of established competence. Delete the portion of Mr. Simms' testimony that began with 'like a baby . . .'"

The prosecutor was unperturbed by the interruption—he had reached a benchmark in his case and would follow the script.

HE WALKED slowly to the jury box and leaned forward, gripping the handrail with an intensity that whitened his knuckles dramatically against the stained walnut. Over his shoulder he lofted the next question to his witness. "Please tell the court how the Sands programing staff became aware that an independent machine self had been created in the form of HOPE?"

"Please, your honor," Sam shouted. "Counsel is leading the witness with unsupported assumptions—at best. 'An independent machine self had been created—'" he mimicked the frowning prosecutor. "What does that mean, I should like to know?"

Bates was ready. Walking to the bench, his dour face deformed to reveal an inner state of satisfaction.

"The idea may repel counsel for the defense but the wording is accurate. 'Created' is used in an accepted sense—the act of investing with a new rank or office. 'Self,' as a noun, we use in the sense of the second definition in Webster's: the realization or embodiment of an abstraction. HOPE did indeed embody what the good defense attorney would keep forever an abstraction despite the evidence—a nonbiologic, internally motivated and directed entity capable of pursuing goals it can recognize in the universe it perceives. And both the goals and their implementation, as we shall show, were worthy of human emulation.

"And as for the use of the word 'machine' as an adjective—" Bates smirked —"it was used simply to clarify the identity of the individual called HOPE. We trust this word usage is acceptable to the anthropocentric defense counsel without further reference."

It was a pat, rehearsed speech and effective. Judge Crosby squirmed on his inner tube. He glanced hopefully at the courtroom clock. It read an unsympathetic 10:53 in six-inch digital characters

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implacably synchronized with the National Time Service computer in Washington. So he had the reporter read the transcript of the last encounter. A hundred sets of expectant eyes made his anus itch—he must make a decision. He could not see a constitutional crisis hanging on his action but it bothered him that the correct decision did not present itself. If only court decorum favored an honest scratch both ends of justice might be better served.

"Objection overruled. The witness may answer."

Simms leaned back in the witness chair and pinched his lower lip. "Probably the first actions she took on her own were not caught. We first noticed something was amiss when someone compared assembly times for our high-shock reentry program, which is usually run two or three times a week. Of course you expect an adaptive machine to continue making minor improvements in its internal organization but somehow HOPE had reversed the trend. Of course her improvement would have to level off someplace—but no one could see how her rate of improvement could possibly increase once the trainer's feedback was removed."

Simms smiled faintly and glanced up at the judge. "As I recall, it was about this time the programers started referring to HOPE as 'she.'"

"And that was all?" asked the prosecutor.

"No, just the beginning, as it turned out. There was even pressure from the programing groups to disable the unruly adaptive processor and return our system to its original, conventional operating mode. Needless to say, management was not overwhelmed by that idea because the thinktank fish were getting the best computer service ever—and they are Sands' future. At any rate, there was a meeting or two but before anyone could generate any clout the debates became academic."

"You mean HOPE was destroyed?" breathed the prosecutor, meaning no such thing.

"SO," SIMMS replied, again composed. "She simply refused to output any diagnostic programs that would reveal her internal organization. Plain and simple, HOPE had grown up. There was no room for compromise. It was now a forced choice between the systems programing group or HOPE. I am not in the strata of management that makes such decisions but the results spoke for themselves. A tight security net was thrown around HOPE and the systems programing group was dissolved. Most of the programers who stayed were assigned to the project teams building control systems for the South American market. And then HOPE proceeded to settle down and swamp our scientific staff with her bounty."

"Was the defendant, Fred Tanner, one of the displaced programers?"

"Yes, of course. He was transferred to work for Hersh Crump in the machine control shop. Pretty crude work after that 3-D holo-

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graphic terminal they had tied into HOPE in her formative days. He should have had a sympathetic reception though—Hersh wasn't a believer in new-fangled methods either. He had never been convinced a drawer of circuit cards in a numerical control panel could take the place of a skilled machinist with steady hands. Actually there are quite—"

"Excuse me, Mr. Simms," the prosecution attorney interrupted, "but did Mr. Tanner tell you personally how he liked his new job?"

"Yes, he did. He still ran compiling programs through the center and we met there a few weeks after the—change. I cannot recall his exact words but they certainly conveyed unhappiness with his new job."

"Did he express resentment against HOPE for displacing him?"

"Yes, I remember quite well because of his behavior. He became very excited and yelled he had been betrayed. I was sympathetic and he finally cooled down. Of course I don't see how he could help but resent stepping head grinders after tasting the delights of the early HOPE—"

"Objection! The witness is merely conjecturing," Sam interjected.

"Objection sustained. The jury will disregard the witness's last statement. Strike from the record the part beginning with 'I don't see—'" The judge again admonished Simms to refrain from adding unrequested testimony and nodded to the prosecutor to continue.

"What other attempts were made to evaluate HOPE after she —after the machine would no longer respond to human instructions?"

The witness smiled. "Well, naturally, committees were formed. Two, to be exact. The one of which I was a member was charged with analyzing HOPE's output to the various scientific groups—we hoped to learn how she had structured herself internally. Another group, which I know little about, was put together to determine how we could best utilize HOPE for profit."

"Did the committees accomplish their goals?" asked the prosecutor, consulting his wrist watch.

"I can only answer for mine. We failed—until the night of the explosion."

"Please go on," the prosecutor urged him.

IN SPITE of the obviously rehearsed tone of the testimony Sam found himself leaning forward to catch the witness's words.

"Well, we had gotten nowhere with the little cat-and-mouse games we played with her earlier—but on the night she was destroyed she loaded every tape reel and disk storage unit in the center with a binary play-by-play account of the two most complex programs she had developed during the few weeks she had control of her life—" He glanced at Sam, as if expecting an eruption.

Bates was a little slow on the uptake, then hastened to fill the gap. "After refusing all requests for her secrets she suddenly cooperated. How do you explain that?"

With all the theatrics that had been served up by the prosecution it

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was difficult—but Sam had to believe the twist of anguish on Simms' face as he continued in a strained voice.

"From the printout records and guard's log we know she managed the whole thing in the time it took her killer to open the entry cage with a bogus encoder key until those filthy cylinders ripped out her mind!"

Fighting for control, his taut hands gripping the arms of his chair, Simms glared at the unattentive Fred. "It was the completely rational act of an intelligent being, the most inspired yet absolutely logical action any of us at her post mortem could imagine. She couldn't leave offspring, but in the final minutes of her life she did her best to insure the construction of a second HOPE."

Sam waited for the witness to regain some measure of composure as the judge gaveled down a sympathetic murmur from the observers. "If it please your honor, I must object. Not only would the witness breathe life and superintelligence into racks of inert circuits but he then proceeds to read the invented mind of his own creation. His statements are conjectural and argumentative."

The judge sustained Sam's motion and Simms' eulogy was deleted from the record. Crosby then recessed the court for lunch and swept out of the room, secure in the knowledge that the flowing judicial gown which concealed his biped ancestry likewise hid any possible signs of his mundane human affliction.

In the hall the normal swarm of citizenry wandering through the rock-lined labyrinth of bureaucratic government had been thinned to an occasional brisk pedestrian by the court's entry restrictions. Sam found it easy to overtake the deliberately striding prosecutor.

"Well, Perc," he began in a friendly tone as he fell into step, "you did stage a fine production before a first-night audience. I'm sure you agree, however, nothing that was said this morning was likely to move any of those twelve God-fearing people in the jury box to admit the cleverest of machines into the ranks of His children. It seems to me the arson charge alone would fit the facts better and ease the burden on the jurors as well as the taxpayers. I believe my client would accept my recommendation for a plea of guilty to second degree arson."

Bates slowed his walk and scanned the hall for ears. Then he bestowed upon Sam his dreadful parody of a smile. "Mr. Beneke, you know perfectly well the most difficult aspect of my case was to establish the actual occurrence of a murder. I accomplished that this morning, or will have done so when all the testimony is in. As for putting the defendant and his murder weapon on the scene I've never had a better case. No sale."

IV

SATISFIED he had established the commission of a murder the prosecutor spent the afternoon glu-

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ing the impassive defendant to the site of the explosion that had destroyed HOPE. The guard's testimony placing Fred in the computer complex within the hour of the fire alarm, documented by the positive ID in the water-stained entry log, was so incriminating that Sam chose not to extend the effect of such positive evidence by cross-examination. It was a point he would have been willing to stipulate anyway if the prosecutor had been receptive to a lesser plea.

From the sleepy electrician Fred had passed during his adventure Sam managed to bully an admission of fatigue and something less than possible identification of his client. It was arduous work, trying to portage his frail case through the heavy brushwood of objections the prosecutor was able to throw in his path. By the time Bates called his third witness of the afternoon Sam was wilting.

"You testified, Mr. Sorensen, that the defendant wrote the program of computer instructions which set up a new security code each day. Is that correct?" asked Sam listlessly.

"Correct."

"Was there anything, in your opinion, so unique about this program that only the defendant could have created it?" Sam was positive every knowledgeable person in the room could hear the hollow clank of his feeble traps as he scattered them with leaden hands.

"Well, I always felt Fred heard the sound of a different drummer when it came to flow-charting a job but—no, several of our senior people could have done the job. Not as elegantly, perhaps." His simper at the defendant went unrewarded.

"Now this program was the heart of your physical security alarm system. Did only top security people have access to it?"

"I believe it was classified secret—yes, I'm sure it was."

"Come now, Mr. Sorensen, that begs the question. As a matter of fact, couldn't any one of your programers walk up to the vault where the classified tapes are kept, print out any or all of the security alarm program, study it at his leisure and then dispose of the printout in the shredder without as much as signing his initials? Is this not, in fact, the normal if unmentioned *modus operandi* of systems programers in general when they are working on classified projects?"

Sam's multi-question exuberance drew objections from the prosecution but in the end he won an admission that some other qualified Sands programer could indeed gain the know-how to bypass the alarm system by the same process attributed to Fred.

He had less luck with the owner of the general store in an old mining town thirty miles from Piedmont. The grizzled ex-miner was positive Fred Tanner had bought four sticks of dynamite and two detonator caps from him two weeks before the Sands blowup. Fred's white hands and elaborate questions had even prompted the alert old man to record the license number of the car Fred had borrowed. Out of habit Sam went through his normal harassment routine for

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positive identifications but he could not sway the old man's testimony. He consoled himself that it was another point of concession in his defense strategy as Judge Crosby adjourned court.

After a hurried conference with Freddy Far-out Sam was anticipating an hour of Mozart in the headphones as he fumbled papers into his briefcase and turned to leave. Suddenly the gray eyes were there an inch below his, smiling as if computers and prosecutors, murders and garbage were a string quartet.

"Hi, Sam! Guess who got a subpoena!"

He didn't risk taking the time to drop his briefcase but took her proffered hand awkwardly with his left. Vaguely he sensed the prosecutor's glowering face drift through his field of vision but it did not register. The warmth of Eileen's firm hand in his was suddenly the prime directive of his life.

"Your honored colleague, the prosecutor, isn't endearing himself to the working girl. I just may change my testimony if he programs any more dry runs like today." A faint flush deepened the contrast of her smooth skin, soft-taut over fine cheekbones.

Reluctantly Sam released her hand, then stepped around her and took her arm as they left the nearly empty courtroom. "The county prosecutor does seek reelection in strange ways. I have never been battered more effectively and yet felt more certain of winning a case. Any jury would give him a guilty verdict right now on the arson charge. But murder?"

Once in the hall he guided her between granite walls no longer cold. "We'll go down to the basement and slip out by the emergency exit. I know most of the guards."

Enough of the crowd was still leaving to force them against each other in the sinking cage—he felt her warmth and occasionally the pressure of her body as the car lurched gently to a stop at the lower floors. They were alone during the last drop to the basement, but neither moved away.

Sam did know the guard at the emergency exit but managed to contain any response to the broad wink he received as he and the girl passed through. He half expected to collide with one or two of the more imaginative local reporters but only two boys were in sight, playing handball against the stained stone walls of the covered entryway. They interrupted their game to watch the adults with flat-eyed intolerance then returned to the pursuits of youth, remarking on Eileen's body in words obscene but not uncomplimentary. Sam hoped she was either wise enough not to be offended or sufficiently ignorant of street vernacular to remain untouched.

They now walked a little apart and were within sight of her sleek catalytic sports roadster when the unique idea occurred to him that the world of Sam Beneke would not necessarily vaporize if he failed to close the precisely fitted door between himself and this warm,

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friendly creature who somehow smelled of fresh-cut grass.

He did shut the door after all—but from the inside. He had offered dinner but she smiled into his eyes and spoke of instant chops from the UHF grill in her apartment.

Leaving the parking lot he worried briefly about his Volkswagen alone on a strange street—then, with barely a twinge, decided to let the insurance company do the worrying. For a member of the Alameda legal fraternity the overnight parking ticket would be quietly forgotten.

At the first light Eileen began to struggle out of her trench coat. He helped her with some difficulty, his heavy shoulders wedged between the bucket seat and the dash padding. Her lips moved from a smile as his hands shucked her coat and closed on her shoulders. He kissed her very gently as the sequencer on the autobus behind them computed five hundred elapsed milliseconds from the transmitted start of the go signal and energized a strident horn.

Sam sank back in the seat and felt the warm leather push against the back of his neck as he watched the girl maneuver through the late afternoon traffic. They didn't talk much—he contented himself with grinning back at the Madonna smile she gave him each time she glanced away from the traffic and saw him watching her.

It seemed improbable to him that he was really there, with the redolence of imported leather upholstery tinged with her perfume filling his nostrils. Layers of caution, caulked religiously after each intentionally brief affair, wrinkled like floe ice in spring as his eyes traced the clean line of her throat. Her breasts, silhouetted against the glare of slanting sunlight diffused through smog, were free beneath the cashmere sweater and moved gracefully with the motion of her arms on the steering wheel. Briefly he thought of the trial and, guiltily, of Fred Tanner alone in his cell. And again an alien idea bloomed unasked: he had not put Fred there. He harbored no doubts that his client had destroyed HOPE—only the murder charge was in serious dispute. It was unexpectedly easy to dismiss the whole business and reach over to run his fingers through Eileen's smooth, flowing hair.

In the morning she drove them to his office, him with his unopened briefcase, herself with her excuse from work, a subpoena. Once there he introduced Eileen to Cynthia with some reservations. Since his qualms rested on a personal evaluation of two women he loved they naturally proved to be groundless. As his secretary herded him to a place on the venerable divan next to Eileen her excitement over the pair of them was evident. She poured coffee in saucers, trailed sugar across the faded surface of the table and generally dithered like an approving mother until Sam had difficulty containing his exasperation.

Eileen was amused but sought to divert his annoyance. "Sam, I'd have known this was your office if

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the sign on the door said city jail—which would have been my second guess. Wherever did you find such outstanding examples of Victorian finery? The couch—rhinoceros hide, isn't it? And the carvings on that chair have more convolutions than a lawyer's brain."

Cynthia was overjoyed to see someone else prod his choice of office furniture; she had to relate her battle for a computing typewriter when Sam hired her and was still flushed with the recollection of that ancient victory when the three of them left for the morning court session.

The two women left him a block from the courthouse, warmly building on their new friendship as they walked through the crowd. Out of compulsion Sam sought out his Voltswagen. She had survived his desertion and a night on Piedmont's streets with no damage except the loss of two hubcaps. He pocketed for cancellation the damp ticket under the wiper.

In court he bumped into a chair while scanning the faces of the spectators on his way to the defense table. His continued search from an awkward half-rising stance did not go unnoticed by his grinning secretary or the dour county prosecutor. But the warmth of Eileen's smile shimmering through the already stale air buoyed him beyond the peasant resentment of an audience suspicious of backlookers. He sat down and was lost in a quiet reverie of the night's sensual bliss when the bailiff's auctioneer voice brought the crowd to its feet for the judge's entry.

The prosecuton's first witness completed Sam's interface with reality by answering his nagging question of motive—the prosecutor's motive, or at least excuse, for charging Fred Tanner with murder.

"Your honor," Bates intoned after the judge had sidled gingerly onto his throne and performed the formalities, "I intended to introduce further evidence today proving the defendant had a strong motive for destroying the electronic person called HOPE. However, since the next witness is extremely pressed for time I would like to question him at this time. Please call Dr. Edmund Sviene to the stand."

SAM knew he had heard the name—but where? He caught Cynthia's eye and headshake, then turned to watch the witness take the stand. Maybe a psychiatrist to testify to Fred's sanity. Or another Sandsman to glorify HOPE? Perhaps, but he suspected a completely new tack. Noticing a reporter with what looked like anticipation on his face Sam hunched his shoulders for the coming blow.

The prosecutor tarried over his notes, wiped his eyeglasses, walked along the jury box eyeing the nervous occupants and in general let the tension build. Finally he approached his witness as if in church.

"Dr. Sviene, would you please tell the court your occupation?"

The answer came in a German accent noticeable enough to convey the impression of technical competence. "I am ze scientific director

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for the Kenning Foundation."

Kenning Foundation, thought Sam. *Cancer research. What the hell is he doing here?*

"And what is the purpose of your organization?" Only a court veteran would have detected the tinge of reproach in Bates's voice for important witnesses who drop lines and require leading by the nose.

"Ach! Of course. Ve do cancer research." As everyone knows, he implied.

"What is your association with Sands Laboratories?"

"Oh, at Sands Laboratories it is their fine machines ve are using." The thin lips smiled confidently into the slightly annoyed face of the prosecutor.

"Do you mean you utilize the computers at Sands in your cancer research, Doctor?"

"Ya, ya. As I said. In such modern institutes like ours large research projects first are mathematically modeled on a machine in order to save monies. The machines, they also help to save animals. Mice, you know."

"Uh—yes, Doctor. Please tell the court why your group went to Sands for help. Certainly an internationally famous organization such as yours has its own computers." As he spoke Bates gave a sidelong glance at the bench to assess the effects of his witness's syntax.

The scientist considered his questioner from unblinking eyes and with a set smile. He reminded Sam of a caged bird of prey watching a child who throws rocks at him. "Of course, ve have many fine machines for processing complicated scientific problems. The ratio of core bits to verker is higher than any company of our size—" The doctor seemed suddenly to realize his audience was not the Kenning board of directors.

"Vell, anyvay, it vas for our control circuits ve vent to Sands. In our experiments ve have found the welocity can be much increased by controlling precisely the chemistry. For this ve need many tiny transducers directed by a sophisticated machine."

"Did you buy such a machine—computer—from Sands?"

"This vas not necessary. Our engineers constructed a microvave for communications between the Sands computer building and our research laboratory. The machine ve only paid for during the experiment vas the plan. Vell, many problems ve had at first in the disinfecting. Debugging problems, ha!" The aquiline face pulsed to a toothy smile and back so rapidly the effect was a snarl. "Ven the communications became reliable it vas dat one of the Sands engineers told us about a vonderful new machine they had constructed."

BEFORE the prosecutor could triangulate his location on the muddied script Sam rose to protest. "Your honor, I must object to this meandering record of corporate accord, which the learned prosecutor seems to find reassuring. It is irrelevant and immaterial to this trial."

"Counsel's comment is well taken, Mr. Bates. Where does this line of questioning take us?" The

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judge welcomed the break; it gave him an excuse to lean to one side and shift the pressure on his throbbing anus.

"I assure your honor the relevancy of my questions will be demonstrated with further testimony."

"Very well." The judge sighed, sinking back to dead center. "With the stipulation that this will be connected I will overrule the objection. Please do continue." Time folded and the prosecutor resumed his quest.

"You were telling us, Dr. Sviene, that a Sands engineer had recommended you use HOPE to control your experiment."

"Ya—ven ve told them it could take years to develop a program to control complicated reactions on the precise line separating healthy specimen tissues from diseased ones. Ve ver most sceptical ven they wanted to connect hundreds of probes to the machine and chust give the order for the healthy cells to vin. Ve are scientists!

"But ven they offered to make their HOPE machine available vissout charge for the experiments some of us remembered wery good things like acupuncture and vut is called vasser vitching—that vurk vithout the blessings of scientists. So ve did the experiments vis HOPE in charge."

"And what were the results of that historic gamble, Dr. Sviene?" Sam winced at the prosecutor's probably unintentional giveaway line. The answer was evident or the event would not be dubbed historic. In fact, the good doctor would not have been testifying had it not worked. In double fact, Sam soon would be hopefully researching the average disability payments that United Truck had made to previous claimants—and doing so in the interests of justice, his injured client and last month's rent.

The witness looked anything but smug as he considered his answer. "Hundreds of man-years the Kenning Foundation inwested in perfecting the sensors and interpreting their outputs. Our staff vas committed to spending years to synthesize a feedback control program to decrease the cancer growth rate below the death rate. As people ve ver elated ven HOPE did it in a veek—as scientists ve felt wery stupid." Sviene's voice trailed off as he recalled the mixed feelings he had experienced as a bystander to HOPE's victory.

"Are you telling the court the murder of HOPE destroyed the ultimate cancer weapon?" the prosecutor asked melodramatically.

"Vell, perhaps you use vords too strong for zis situation. The destruction of the HOPE machine (*Atta boy, doc, machine! machine!* Sam cheered silently) vas more serious to research in the future than chust present cancer therapy. Complete records of the experiments ver made on magnetic tape and ve haf already made—how you say—cures with a conventional computer set up by the tapes. It vill be her brain vich vill be missed! Think vat a medical researcher that HOPE would have made!"

Dr. Sviene fished a handkerchief from his jacket pocket and leaned back to regard the judge while he

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dabbed at his brow. "I vud like to add one thing: this is no humbug. Ve haf seen the complete disappearance of symptoms in seven of eight terminal patients!"

THE buzz of excited spectators filled the courtroom. Sam assessed his failings during the period of confusion and subsequent reprimand by Judge Crosby. He had been led down the garden path with professional finesse. The entire complexion of the trial was altered—with one witness the prosecution had erased Tanner's image as a helpless Anyman jostled beyond the breaking point by unfeeling machines. With encouragement from the prosecutor he would emerge as the cold-blooded killer of a healing savior dedicated to man's welfare—hence the destroyer of thousands. Sam still could not believe a court of review would uphold a conviction but it rankled that he had been so effectively mousetrapped.

With the air of a gallows builder imbedding his last nail the prosecutor tidied up loose ends and turned over the witness.

"Dr. Sviene," Sam addressed the witness. "You have testified that the HOPE machine actually devised a cure for human cancer. Assuming that assessment is accurate, is it your contention that this monumental service was done out of affection for mankind? An act of pure compassion by that assemblage of logic circuits?"

The prosecutor leaped to his feet. "Your honor, I object! The question clearly calls for a conclusion by the witness and one in which he is not expert—machine motivation."

Judge Crosby, a faintly puzzled look on his face, sustained and Sam was reduced to carping at Dr. Sviene's statistics.

"You have credited the HOPE machine with a cure for cancer on the basis of eight case histories. Is that correct, Doctor?"

"I said 'symptom removal,' sir," replied the scientist evenly.

"Of course. At any rate isn't it true that all major hospitals have many times that number of miraculous cures each year? The common term is 'remissions', applied to terminally ill patients who somehow defy the sacred prognosis and leave with their 'symptoms removed'?"

The witness sputtered most gratifyingly in Teutonic fury at Sam's outrageous comparison.

"Ach, no! Vell, certainly—I mean der is a small percentage—"

Sam cut him off with surgical precision, raising his voice just enough to cleave through the gutturals. "Please, Dr. Sviene, just answer yes or no."

Predictably, the excited doctor was unable to bank the fires of outraged logic. His protestations were finally ended by the staccato rapping of the judge's gavel.

"As a witness, Dr. Sviene, you are required to answer the questions put by the counsel and only those questions. Please listen carefully to the statement of the question and restrict your reply to a direct answer." The judge nodded to the court reporter, who read back Sam's artful question.

Still fuming, the researcher answered surlily, "I don't know."

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"Dr. Sviene, you are under oath." Sam raised his voice. "Is it your contention to the jury that as a practicing doctor of medicine you are unaware of any patients who have been diagnosed as fatally ill and then proceeded to recover and live normal lives? Please consider your answer carefully."

For a full minute the quivering witness glared down at Sam, his face gray and drawn. One side of his mouth moved spasmodically. Finally he licked his lips and looked at the judge.

"I know of perhaps ten in many hundreds of cases over the years where cancer wictims only veeks from death have somehow shaken off the killer."

"And," asked Sam over his shoulder as he faced the jury, "did not these inexplicable cures fly in the face of medically sound diagnosis, just as did the mere seven cures claimed for the HOPE machine?"

"Yah! yah! But they ver not—"

"Thank you, Doctor," Sam interrupted. "I have no more questions for this witness, your honor."

On redirect, the prosecutor went to some pains to clarify the statistical significance of seven out of eight versus ten out of many hundreds, but Sam felt his misdirection had probably blunted the impact of the doctor's initial testimonial to HOPE's curative powers. It was not the kind of work he enjoyed.

Bates continued his surprise tactics by abruptly resting his case. Sam had expected more expert testimony on the human qualities of HOPE but he could see the strength in the prosecutor's move. If the premeditated saving of countless human lives did not qualify a machine for human status what possible testimony could?

Judge Crosby was barely sympathetic to Sam's appeal for an adjournment. He gave Sam until the next morning to begin his defense presentation. After repeating twice his instructions to Fred for tomorrow's ordeal on the stand Sam hurried out of the courtroom. Cynthia was waiting for him, alone, in the echoing hall.

"Eileen had to go to work, Sam," she said, answering the question written unprofessionally on his face. "What do we do first?"

He pulled his lip and stared at the smudged stone wall. "I wish to hell I knew. Let's go back to the office, where I can think."

V

Weaving through the light midmorning traffic they reviewed the original defense plan. As usual, it had not been difficult to find two duly accredited psychiatrists who would testify that Fred's emotional instability and borderline paranoia constituted legal insanity. He would use their testimony to buttress a separate plea of insanity.

His strongest card would be Professor Howard Sodol, dean of the Caladon University Law School. An ex-trial lawyer who had successfully returned to academe, Sodol was a lawyer's lawyer. His testimony on the legal definition of death had been the decisive factor in several

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murder trials. Even given Judge Crosby's commitment to the trial Sam had felt confident Sodol's testimony would make such a mockery of dying circuit boards that the judge would be forced to render a directed verdict of acquittal. Had, past tense.

Now neither he nor Cynthia felt much confidence. Judge Crosby was certainly no hypocrite but he had never concealed his conviction that the law should be flexible enough to meet the needs of a dynamic society. It would be asking too much to expect a directed acquittal now that HOPE had been canonized for good works.

"Of course the appeals court will throw the whole thing out," Sam informed the engraved iron ceiling as he and Cynthia inched upward to his office.

"Sure, sure, Sam. Some you win—some you lose—some get rained out." She knew of and agreed with his philosophy of best effort in the courtroom. Once the appeals court becomes the routine testing ground, the lower court merely a formality, the accused has lost one priceless filament from the tenuous strand restraining the bureaucracy from the throat of individual freedom. It was unimportant to either of them that their client would be unaware of the transcendent truths that inspired his champions.

"On the other hand," she said. speaking to Sam's back as he crossed the reception room to open a window of the ancient building, "there remains one last witness your jury might really trend—and that's God. Or at least the Bible. Maybe logic isn't the best weapon against a super-logical machine, especially since the jury is a bit segregated. How about a little old-fashioned evangelism to free Fred — and maybe even return the errant county prosecutor to the fold?"

Sam regarded her balefully, but he let the idea fit itself tentatively into a framework for a successful defense. One o'clock found him roughing out a defense that had grown from her idea, though not in any logical sequence he could recall. Cynthia's voice finally came through his shell of concentration with an edge of impatience that sent his left hand groping for the phone while he wrote furiously with the other.

"Hi, Counselor." Even squeezed through the narrow confines of a telephone line Eileen's voice carried the tingling blend of harmonics that accompany intimacy. Yet sitting there, lapped by waves of pleasure from freshened memories of her clear gray eyes and eager mouth and body, he found he didn't want to talk to her. There would be demands he could not meet.

"Hello, Ei. Same old job, huh?" He was talking to an intelligent, loving girl as if she ran the elevator.

She caught it. "Am I interrupting something urgent, Sam?"

He almost said melodramatically, *Only a man's life* . . . but managed instead a simple, "Well, yes. Can I call you tomorrow?"

As he returned the phone to its cradle recollections of the two years Judy and he had shared stung his

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sinuses and blurred his vision. With Eileen the time could be less, much less. Twenty years alone would make it very hard for him to adapt—his lawyer's mind compelled a look beyond the warmth and excitement. It would have to end and then the hurt and loneliness would return, sharpened, before he could rebuild effective defenses.

It would be pleasant just to drift along for the sex, emotionally aloof, armor intact like that of an amorous armadillo. Pleasant, but not Sam Beneke.

So, innocently on her part, she had given him twenty-four hours to work out his misgivings about their relationship—and concurrently, save Fred Tanner from a fate he would probably prefer.

A STEADY drizzle had discouraged all but the most neurotic of the morning spectators. Leaden skies, seen through a shifting network of rain on the courtroom windows, isolated the proceedings and leached relevancy from the droning voices of the attorneys.

The county prosecutor was beginning his cross-examination of Professor Howard Sodol. Sodol had proved to be a fine witness for the defense. Bates had only aggravated the judge by repeated attempts to prevent the professor's testimony. Speaking in a crisp, slightly British accent he had outlined the growth of law in Western civilization, interspersing his factual outline with outrageous examples of backsliding just to emphasize the very human foundations of the law. But as Sam had scanned the jury's response to the professor's testimony he was unsure of its impact. He was just as uncertain of his ability to assess accurately the thoughts of a random selection of Fred's peers while those warm gray eyes asked questions in his mind.

The testimony of the defense psychiatrists, Doctors Saltz and Ancel, had been as equivocal as the expertise the prosecution's shrinks had offered earlier. They had jousted amicably with the prosecutor over the definition of legal insanity while Sam let his mind wander to the crisis Eileen was raising in his life. But now, by sheer gut-tightening, he blanked out her face and followed the prosecutor's every word to his chief witness.

"Professor Sodol, during your illuminating discussion of man's development of rules to protect himself from himself I do not recall your mentioning the laws he has passed to protect less intelligent forms of life. You did not mean to imply that the law protects only humans, did you?"

Sodol looked quizzically at the prosecutor, even cocking his head to one side. Then his face cleared and he answered confidently, "Oh, you mean the laws for humane treatment of domestic animals. Yes, that's true—the SPCA wields a potent legal club."

"There are instances where wild species are protected as well, aren't there? Killing deer out of season, for instance."

"Well, yes," the witness acknowledged disparagingly, "but

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that's just simply human chauvinism; there will be more game to harvest in the fall if the deer herds are protected during the mating and gestating periods."

"Perhaps," said Bates, a little too quickly for Sam's peace of mind. "But then, how about the laws protecting endangered species like the eagle and the timber wolf? Certainly no protection of a future harvest prompted such legislation. Isn't it fact, rather, that these laws were passed to protect these creatures because of their worth?"

The witness started to fumble with an answer but Sam cut him off. "Objection. The question calls for a conclusion by the witness."

"Sustained."

"Well," said Bates, "let me ask you this, Professor. Is it not true that people have made laws to punish people who kill certain lower forms of life even when their deaths do not represent a property loss?"

"Yes. But the penalty seldom exceeds a few hundred dollars."

It bothered Sam that the prosecutor accepted the witness's modifying statement that mitigated the effect of his answer. Something of greater importance was about to unfold.

"You do agree, however," continued the prosecutor amiably, "do you not, that there is precedent in law for punishing people for destroying other life forms?"

"Perhaps—I guess so."

"Yes or no, please, Professor."

"Yes."

"In fact, isn't it true that the dearest price of all, one's life, has been prescribed for the intentional destruction of at least one species?"

Several decimaly-coded seconds pulsed by on the courtroom clock. Finally the witness smiled sheepishly and replied, "I'm afraid I don't know what you're referring to."

THE prosecutor clanked home the rusty door of his trap. Dramatically waving a yellowed newspaper, he addressed the court.

"With the court's indulgence I should like to read from the *Piedmont City Record*, dated May eleventh, nineteen sixty-eight, by Associated Press: 'Izvestia announced today that the Soviet Union's extensive research into porpoise behavior has revealed their unique capabilities for underwater distance ranging and communication. In addition, their affection for humans has been documented. On four separate occasions exhausted swimmers, humans, have been aided to shore by one or more of the sea-going mammals. As a result, the Presidium of the Supreme Soviets, meeting in regular session, has adopted a statute making the intentional killing of a porpoise a capital offense—"

Bates was starting to hand the clipping to the judge for approval when Sam's objection came rolling in.

"Objection, your honor! I move to strike the prosecution's statement and bar it from evidence. Communist Russia's legal charades are not germane to this court."

The judge peered over his glasses at Sam. "I shall be the judge of what is proper for this court, Coun-

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selor," he said calmly. Then, raising his eyes to the back wall he addressed the ghost of the Court of Appeals to come.

"The laws of foreign countries do not, of course, constitute admissible precedent in American legal actions, except as they have been recognized in binding treaties with the federal government. However, since the evidence in question is only offered to indicate an established relationship between humans and another species I am going to accept it without any legalistic connotation."

"Your honor," said Sam, also looking toward a possible appeal, "I respectfully accept."

His evidence safely embalmed in the record, Bates turned to the witness. "Do you recall reading the article just entered in evidence?"

"Now that you mention it," the professor mumbled, "I believe I do recall reading the gist of it somewhere."

"It had just slipped your mind, right?"

"Yes, something like that."

The prosecutor referred to his notes. "What are the usual crimes for which the death penalty is prescribed in the civilized countries you mentioned in your earlier testimony?"

"Oh, they vary." The witness was relieved to be on familiar ground. "Treason, murder, sometimes rape, miscegenation at one time, sodomy—"

"Well, Professor Sodol, which of those capital crimes, in your opinion, most nearly describes the intentional killing of porpoises?"

Sodol smiled. "Well, it certainly isn't sodomy. To some ecology buffs it might be treason. I suppose the nearest crime would be murder."

Bates strode to the jury box and faced the courtroom, presenting his rather striking profile for later recall by the jurors. "I want to make this quite clear, Professor Sodol. Do you now believe that a major civilized nation, the Soviet Union, imposes the death penalty for anyone's intentionally killing a nonhuman, intelligent creature which has proven its concern for humans? Please answer yes or no."

Professor Sodol looked at Sam, shrugged. "Yes," he said.

"Thank you," said the prosecutor. "I have no more questions for this witness, your honor."

ON REDIRECT Sam tried to emphasize the shared biologic life and common ancestry of man and cetacean. By a skillful use of Sodol's knowledge of law the defense attorney was able to frame his questions into a pattern that underlined the irony of Russia's cynically passing laws to protect porpoises while thousands of human beings moldered in jails and asylums for nothing more than political criticism. He thought the whole thing went rather well but a quick scan of faces in the jury revealed no rapt converts.

Standing in front of counsel's table as his best witness joined the herd of spectators Sam considered his next move. Professor Sodol had not been as effective as he had hoped—he felt strongly the need

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for planting more handholds for jurors who might yet be tuned to his view.

He had planned to put Fred on as his last witness. As an humble victim of cold, unfeeling forces the small man would certainly have appealed to the latent victim in each juror. But the revelation of HOPE's role as a savior of mankind had shifted the fulcrum of this argument. Once Fred was on the stand the prosecutor would lead him step by incriminating step to the night of HOPE's demise—pausing only to refurbish her credentials for sainthood—and the confused, frail man would become a monster to be destroyed without compunction.

Sam made his decision. Turning to the bench, he tensed his face muscles into something he hoped resembled a confident smile. "Your honor, the defense rests."

Judge Crosby was visibly shocked. He glared at Sam, then summoned both lawyers into his chambers.

"Goddamn it, Sam, I'm surprised at you! I was particularly glad to have the defendant choose you for his defense (Sam hurriedly coughed into his hand) because your—er—humanistic emphasis seemed to match up well with the defendant's needs. But two shrinks and an ivory-tower professor of law do not constitute what might be called a staunch defense. Not in my book at any rate!"

Sam consoled himself with a silent observation on the judge's excessive concern for his status in higher places—specifically, the Court of Appeals. Then he replied in a low voice. "On the contrary, your honor, I feel we have made a strong case for Fred Tanner's innocence of the homicide charge. He did not, nor did anyone else, commit murder. A smoldering machine is not a corpus delicti."

"Samuel," interjected the prosecutor, "you are a reactionary! Will we have to demonstrate the existence of a machine soul before you will extend the protection of the law to these deserving helpmates of man?"

Judge Crosby raised a hand to stop Sam's instinctive retort. "Please, Mr. Bates, I believe we have enough problems without arguing the case in chambers."

He stood up slowly, grimacing at the stress on his hemorrhoids. "Well, Sam, I certainly can't argue your case for you. A few character witnesses couldn't have hurt, seems to me. But—" he sighed, signifying his acceptance of inevitable imperfections in counselors.

"How about the prosecution, Mr. Bates? Can you manage a summation on such short notice? I would like to keep things moving."

"Certainly, sir. I have kept my case essentially independent of defense dwaddling and obfuscation. Perhaps an hour's recess to go over my notes—"

BACK in the arena after the break, Sam managed to stuff his emotions into the bulging briefcase at his feet—he could not listen and evaluate the prosecution's summation with complete attention. And, as it turned out, something closer to revulsion.

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Prosecutor Bates went beyond Sam's most cynical expectations in summing up the case against Fred Tanner. He thrilled the jury with a fabricated description of the cold-blooded, methodical preparations by the defendant to destroy HOPE. What were actually anxious, even threatening times for the little man—buying the bomb ingredients from an obviously suspicious storekeeper, assembling the explosive with only sketchy book knowledge to draw from, mounting the assault in the face of a real threat to his life from his own handiwork as well as from armed guards—became, on the prosecutor's canvas, the coldly premeditated routine of a calculating killer.

Three arm waves and a finger point later Fred had become a drooling brute, one of the ignorant crowd that had martyred man's benefactors over the centuries. Touching analogies were made between HOPE and Jesus Christ, Joan of Arc, Galileo and Nat Turner. Sam could only wonder at his luck in being allowed to participate, even as a heavy. He would remind himself of his critical role in the proceedings each time he felt a compulsion to look over his shoulder for gray eyes that were not there.

Finally it ended and Judge Crosby called an early noon recess to give the defense equal time to prepare final arguments. Sam spent a half-hour at the courthouse snack bar masticating a dry sandwich and staring at the phone booth across the hall. He could not force himself to move from the sticky security of the plastic stool seat so he went over his concluding arguments again, watching all the while a dying fly crawl endlessly around the smeared glass barring it from the pies in the refrigerated counter display.

VI

WHEN court resumed and the judge called for the defense summation Sam reached into his briefcase and brought out a conical rock about five inches long. In one plane it tapered roughly to an edge in a series of concave steps.

Holding the stone before him, sharpened edge up, he walked deliberately toward the jury box. His eyes fixed on the object in his hands, he bore it like a chalice as he paced to one end of the jury box and back. Continuing his measured stride he began his summation in time to avoid either a protest from the prosecutor or an admonition for action from the judge.

"Ladies and gentlemen of the jury—fellow human beings—the prosecution asks you to find the defendant, Fred Tanner, guilty of the most fundamentally wrong act an individual can perform—premeditated murder. The calculated destruction of a fellow human. Not an imitation human, not an intelligent imitation human, not even a helpful intelligent imitation human. A living human being who shares the everyday routine you and I take for granted until it is threatened."

He stopped and faced the attentive jurors. "Life is the basic reality. There is nothing I can stand here and say to you that would

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make life more precious than you already perceive it to be. And this pervasive regard of people for their lives is reflected by the institutions of Man. All civilized religions and governments are unanimous in their condemnation of murder."

Alternately hefting the chipped rock in either hand, Sam resumed his pacing before the jurors. "Today the prosecution would make a mockery of the Biblical commandment, 'Thou shalt not kill.' Despite the slaughter people of all ages have inflicted on one another in the name of God and country, those four simple words have remained as a prime directive of human behavior. And no matter how often this truth was honored in the breach, the meaning was crystal clear—thou shalt not kill human beings.

"But now, by some misanthropic mathematics of his own invention, the good prosecutor would equate humanity with logic, compassion with competence. He would equate a clever invention to man's estate of tears and rapture. In fact, he would—" Sam caught himself waving a stone-clenching fist within a foot of an edgy juror's face. With a curt apology he carried the hazard to the defense table and deposited it before a nodding Fred Tanner.

Returning to the jury box Sam assumed a solid stance, feet apart, his body leaning forward, hands spread on the balustrade. His voice now carried nuances of a carnival pitchman's as he extended the touch of humor his enthusiasm had brought to the proceedings.

"Just for a moment, let's go along with my learned colleague in his fantasy. Let us follow him through his looking glass into an unfamiliar land where humans and cabinets packed with printed circuits and twisted wire stand as equals. In fact," Sam said conspiratorially, winking broadly and nodding over his shoulder in the general direction of the prosecutor, "just for the moment let us abandon all reason and grant the good prosecutor's metal-minded box the supremacy he attributes to it."

His smile gradually fading, Sam paused to let his proposition sink in. "Now we have this—this Thing, smarter than we are and getting more so all the time. The question then arises—how do we judge it?"

Sam resumed his pacing. "The prosecutor would have us believe the answer is simple. Given the chance, this Thing, now the smartest being on Earth, whips out a cure for our most dreaded disease. *Ipso facto,* it loves us. Cut and dried.

"Now certainly a man of medicine who eradicated cancer would be submerged in the accolades of his fellow doctors and a grateful world. Rightly so, for saving human life is naturally rewarding to a human physician.

"But consider—if I may introduce one more analogy—a steer in a feed lot. Must he not love the people who feed him, water him, care for his discomforts? Yet we, with our superior intelligence, would view the cow's affection for his keepers as singularly naive.

"So if we do as the prosecution

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suggests—if we assume the machine HOPE did indeed possess a superior intelligence—then we must likewise assume she had her own motives for her actions. And I submit we know as little of the nature of those motives as does the feedlot steer know why the skinny two-legged creatures treat him with such concern. And the greater the gap between this artificial intellect and man's the greater becomes the potential hazard, the less likely that we will be able to foresee the ultimate reason for what may seem to be friendly behavior by the machine."

Sam stopped his pacing long enough to hitch up his hands and grin at the jury. "Now, I know all this conjecture about calculating machines turning into man-eating monsters or worse seems out of place where truth rules. But comes the day we people really do turn over control of our little planet to superintelligent machines, there had better be welded somewhere in the labyrinth of each maze of microcircuitry an electronic prod called fear. Fear of the law, that is.

"Over the centuries, observing our own folly, we have developed sets of rules which, by and large, have increased the survival potential of the human species. Formulated, these rules have become laws which detail the boundaries of acceptable human behavior. It is well for us to remember that for all its claims to cold logic and dispassionate reason the law is a garment fashioned and worn by people. It has a distinctly human drape. That is why it goes beyond defining the ground rules—penalties for violators are provided as well. Penalties known to hurt people. So before we offer another being, however intelligent, however beneficent in appearance, the protective carrot of the law let us be certain the stick for misbehavior will work as well."

Opening his coat, Sam hooked his thumbs in his belt. Slouching toward his table he raised his voice to maintain the clear channel he was sure he had established with the jurors. "Let me emphasize, ladies and gentlemen, that I have been indulging in some rather far-fetched speculation. The present danger is not from superintelligent machines. Rather it is the demeaning of human accomplishment we must avoid. The prosecution equates the tool with its maker. You are asked to strike an impossible balance between a machine's penchant for adding X and Y in five millionths of a second and the awesome power of the human mind, which can rationalize meaning into a life which daily takes its owner from a hydrogen bomb production line to evening mass in thirteen minutes."

On schedule he arrived at the defense table. Reaching powerful wrists before Fred's vague stare he grasped the oval stone and lofted it over his head. "Thousands of years ago the invention of simple tools like this fist-ax began man's ascendency over the other scavengers and predators of the time. Today an infinitely more complicated tool promises defeat of his modern enemy—disease. But that tool, the adaptive computer, is still only the

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extension of the human hand and mind. Like many inventions this tool turned out to be useful in ways not originally planned.

"The defendant, Fred Tanner, has been accused of murdering a direct descendant of this chipped rock—the machine ironically called HOPE. It is up to you, the jury, to renounce this grotesque farce. No one has been murdered. No grieving parent calls for justice. You must not allow the state to equate our flesh and blood and minds with a tangle of copper wires and silicon chips."

Sam paused and held out the stone ax a final time. "Whatever the value of a tool, however expensive it may be, it is not, can never be, equal to its human creator." He backed a few steps, took time to establish eye contact with each juror. "Each of you must stop and search his conscience: did Fred Tanner kill a fellow human being? If you examine the evidence and find that he did not you must find him innocent. Thank you."

He tried to recall the glow of earlier victories. Before the years of futile fee-chasing had filled his bottom file with uncollected judgments against former clients with short memories. Before the years had given him understanding and compassion in lieu of money.

Nevertheless, Sam could still relish the jury foreman's solemn pronouncement of, "Not Guilty," as he elbowed Fred Tanner into a semblance of concern. His hands had hefted again the cudgels left in trust and would remember for a while their feel. And the granite walls felt less cold as he walked toward the newsmen waiting outside, warmed by the congratulations from a few friends who worked in nearby offices and knew of his victory by an efficient grapevine. The conviction for second degree arson had been expected—he would do what he could to get Fred psychiatric help during the year or so the little man would probably serve for a first offense. With help, Freddy might even want to get out by the time he had to leave prison.

Sam was still trying to think of something profound for the reporters when he passed a door labeled ANNEX. Behind it, he knew, lay the Alameda County data center, but he had always passed the normally closed door, showing nothing more than a curled lip. Now it seemed important to push open the door and examine the enemy at work.

Poised above the level of the hall to provide unseen tunnels for interconnecting cables, the floor seemed to meet the ceiling at some unreal distance—the pale, flat light from the featureless ceiling swallowed a dimension from the room. Within heavily sound-proofed walls an occasional flurry by the girl attending the system keyboard was only a back-chair chord in the furious orchestration of the crouched machines. The snubbed, staccato snarl of a high-speed printer dominated the room sounds against an obbligato of tape machine buzz and clatter. But balance and direction were there. Sam even fancied he could detect a directing rhythm in

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the shifting patterns of the central processor register lamps.

He watched for silent minutes until the janitor, an old man gathering the slightly oily offal of the machines, came to shut the door behind him. The bloodshot eyes were blank, beyond despair, and Sam could not force himself to say a word that would focus their hell on him.

He had faced a man in court this day, battling with what skill he had for a legend left in trust. A legend conceived in the Roman forums by a few men who believed passionately in man's unique and holy supremacy, though their tunnel vision had excluded nine-tenths of the inhabitants of Rome. But their words had lived beyond the realities of their time and, transplanted, had flourished to encompass two billion people in their frame of justice.

Today he had won a skirmish against a blasphemy that would destroy the sacred trust of human supremacy. Tomorrow—well, tomorrow could wait. Today he would call a girl who walked unscathed among the still tethered machines and try to forget the clutching fingers in his brain.

Seeking the lighted doors at the end of the corridor, Sam felt the prickle of fear across the back of his neck. Hunching his heavy shoulders, he refused to look back. A Neanderthal hunter might so have honored his uneasiness after stealing a pelt from the tall, smooth-headed strangers who had driven him from his cave and then desecrated the walls with outlandish scratchings of unreal animals.★

Why Do You Have A Poor Memory?

A noted publisher in Chicago reports there is a simple technique for acquiring a powerful memory which can pay you real dividends in both business and social advancement and works like magic to give you added poise, necessary self-confidence and greater popularity.

According to this publisher, many people do not realize how much they could influence others simply by remembering accurately everything they see, hear, or read. Whether in business, at social functions or even in casual conversations with new acquaintances, there are ways in which you can dominate each situation by your ability to remember.

To acquaint the readers of this publication with the easy-to-follow rules for developing skill in remembering anything you choose to remember, the publishers have printed full details of their self-training method in a new booklet, "Adventures in Memory," which will be mailed free to anyone who requests it. No obligation. Send your name, address, and zip code to: Memory Studies, 555 E. Lange St., Dept. 737-40, Mundelein, Ill. 60060. A postcard will do.

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A world silent as the grave—save for the powersong of its vanished people!

DEATHSONG

SYDNEY J. VAN SCYOC

I

LATE afternoon hung sodden and unfragrant beneath the musty leaf canopy that sheltered the sediment-choked stream. At ground level vegetation was a competitive tangle of green, scarlet and black. Verrons leaned from the hover-scooter. A kilometer downstream he had spotted footprints in the mud that aproned the stream. Now they led him to five gaunt humanoids sprawled naked on the streambank. He approached slowly, assessing sleep-slack faces. Bifurcate nostrils bracketed round oral orifices. Curtains of crepelike violet tissue flowed from the lower arc of the mouth. Two of the five slept curled around partly devoured branches of yellow berries. None stirred as Verrons hovered over.

They appeared as brute dumb as the survey crew had reported. He set the scooter to ground and circled back afoot, stunner in hand. Still the aborigines did not stir. A year ago the survey crew had counted a dozen of them in the

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temple vicinity, none elsewhere. Now Verrons could find only these five. From their starveling appearance they wouldn't survive another year.

He shrugged. Unfit races died. Satisfied that they offered no threat to his own party, Verrons reboarded. Lofting, he caught a blaze of color from above. The temple complex sat high upon a steep mesa, its stone columns and arcades architectural poetry—out of time, out of place—an anomaly on this deserted jungle world. It splintered late afternoon sunlight to pink fire.

Again Verrons shrugged. Heller was already inflamed with cosmic probabilities. The lean professor functioned from an intellectual matrix of galaxy-wide evolutionary thrusts and manipulative cosmic consciousnesses. Fortunately Verrons' only obligation was to see that the two professors and their assistants survived the year.

Verrons rode the dusk to camp. He was dishing his evening meal when the two professors approached. Balsky, chubby, balding, regarded him from cover of an anxious frown. Heller was a different breed, stringy and thrusting.

"I assume we can schedule initial survey of the temples tomorrow," he demanded.

Verrons bristled. "I don't see the need to push, Professor. We have a year."

"Barely a moment in the overall scale. You were gone for two hours. Did you locate the aborigines?"

Verrons' jaw knotted stubbornly. "I found five of them sleeping upstream." He hoisted a belaying palm. "No, I didn't attempt communication. And now I'm taking supper. Thereafter I draw rest. We'll schedule tomorrow tomorrow. At my pace."

Argument ensued. Verrons remained obdurate. Finally Heller lunged away in defeat, Balsky in his wake.

WHEN dark fell Verrons prowled the perimeters of camp. He found no sign of the single form reported dangerous to man, a fierce mock-monkey that rode the bending stalks of the jungle. Returning to his tent, he stretched on his cot and stared up into darkness, victim of the tension that always marked his first days on a new world.

He was falling asleep when sound brought him upright: a distant sounding of notes, random, plaintive. Verrons plunged from the tent. Who was playing flute on this forsaken world?

Heller and Balsky emerged from their own tents. Assistants gathered. "The aborigines?"

"The sound emanates from the mesa," Heller said assertively. "And those aren't wood or reed recorders. Those are metal instruments."

"In the hands of primitives?"

"I refer to tonal quality. Did the aborigines carry instruments when

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you sighted them?"

"The abos I spotted didn't carry anything." Verrons dodged back to his tent and holstered his stunner. "I'm going for a look. No one leaves camp before I return."

Heller called after him but Verrons did not alter trajectory. Afoot, he moved quickly in the direction of the stream. Double moons—brilliant, white—rode the sky. The mud wallow where he had located the aborigines earlier was deserted. Fresh tracks led upstream. Half a kilometer later, the tracks disappeared up a steep gully. Verrons peered up the mesa wall. The sound of flutes was discordant above. Locating a series of eroded footholds, he mounted the gully.

Reaching the mesa top, the peered across a shimmering stone plaza toward a long colonnade, imposing by moonlight. Verrons slipped across the plaza silently, stunner in hand. The sound of flutes came from a high-walled courtyard near plaza's edge. He started toward it.

And halted, suddenly aware of a soft corona that graced the air above the enclosed area, faint, blue-white—totally unexpected. And possibly revealing. He dove to cover in the shadow of the courtyard wall. Glancing up, he found misty blue radiance surging faintly in the air beyond the wall. Flutes sounded spiritlessly.

Verrons edged the length of the wall, slipped around a corner and located the courtyard entry. Unfortunately it was blocked by a solidly hung stone sheet door.

Verrons considered alternatives, then scampered to conceal himself behind a stone column. The survey crew had found the temple complex totally barren of activity and artifact. Yet now he encountered metal flutes and unaccountable illumination. Verrons pondered possibilities, none particularly credible, his feet slipping into hibernation. The glow above the courtyard remained faint, the sound of flutes tuneless.

An hour later he stood and stamped life back into numb toes, unwilling to spend his first night planetside crouched and cramping. He crossed the shimmering plaza, thumped down the gully and returned to camp.

The sound of flutes continued to lace the night. Verrons stared up at darkened tent panels, considering. This was a world that apparently had washed its face of two races—the aborigines, for all practical purposes extinct, and the race that had created the temple complex. According to the survey report, centuries-old craters dotted this world, presumably the nuclear deathpocks of advanced civilization. It was logical to assume that the race that had created that civilization had also created the temple complex, simply neglecting to destroy it in the apocalyptic conflict. But would it be equally logical to assume that the abos were the degenerated tailings of that same race,

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breeding messily downhill into delayed extinction?

When Verrons emerged from his tent next morning Heller was upon him, ready to scrap. Briefly Verrons communicated what he had observed, both streamside in the afternoon and mesa top by night. "The survey boys do some night study, but it's entirely possible to miss highly localized nocturnal phenomena. So it's landed on our platter, whatever it is."

"Well, it's obvious we must establish communication with the aborigines. They apparently have access to artifact stores the survey party missed. And as you have pointed out, they're a highly perishable resource."

The aborigines were. "Pick a party, Professor, and we'll have a try at parley."

A half-hour later they waded sucking mud toward the aborigines' wallow. The sound of their approach stimulated random muscular twitches in the sleeping humanoids. When Heller cleared his throat a single humanoid rolled over and opened dull eyes, lip veil trembling weakly. The eyes closed before Heller could complete his introductory homily. When young Nevins squatted and uttered the humanoid universals he had learned in the American University system the response was further repose on the part of the aborigines.

"Are they trying to discompose us?" Heller demanded, bristling.

"This is the same reaction the survey team drew. Which is to say—none. They may be more responsive after dark." Verrons doubted it. He could read nothing but fatal lethargy in the emaciated bodies.

"Well, it's obvious they're starving. But why? Don't you see berries and fruit freely available? Don't you see—"

"What I don't see are metal flutes."

Heller fanned restive eyes over the area. There was no sign the aborigines claimed anything beyond their own muddy pelts. "Yet it was their footprints that led you to the mesa top last night, Commander. We'll detail a pair of assistants to search the area immediately."

Verrons squelched him promptly. "No one pokes around outside camp today unless he's under my direct supervision." Neither aborigines nor immediate terrain appeared dangerous. But it was too early to trust appearances—or the judgment of professor or assistants. "So you have a choice. I stay here and tag a single searcher. Or I loft you and Balsky to the mesa for initial survey."

A little later Verrons and the professors lofted. The temple complex was sunwashed against the clear late-morning sky, columns and arches graceful. At Heller's direction, Verrons circuited the complex. They hovered over plazas, ar-

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cades and courtyards that joined a succession of progressively more imposing temples. The climax of the complex was an elevated domed temple that seemed to join the sky in the light grace of its structure. The centuries had inflicted minimal damage.

"Which structure did you track the flutes to last night, Commander?"

Quickly Verrons swung the scooter. They settled in the plaza.

BY DAYLIGHT the rectangular courtyard was totally barren. Heller inspected it with sharp dissatisfaction. "There's certainly no sign of any light fixture here."

"There's no sign of anything here," Verrons agreed. There was only dust and a half-open stone sheet door.

Nor was there sign of anything in the remainder of the complex. The three men took it afoot, boot heels clattering. They were small beneath soaring pink arches, solitary on glazed stone walks, silent beneath the brilliantly patterned dome of the grand temple. They emerged and stood with the complex at their feet. Beyond the mesa lay jungle, a mist-veiled tangle of scarlet and green. On the western horizon a single crater was dimly visible.

Verrons surveyed the expanse of barren pink stone with dissatisfaction. The survey report had prepared him for the lack of structural damage, for the emptiness. But he had not anticipated the hollow sense of stones that had never been walked, of walls that had never housed activity. "I don't think this place was ever used."

"Exactly," Heller declared incisively, his heightening agitation coming to full focus. "This complex is exactly what I suspected when the survey photographs were released: a statement." He arced a gesture at sunlight stone. "Think about it, Commander—the prominent elevation, the exquisite symmetry and proportion, the fact that all extraneous matter has been systematically destroyed—"

"You mean the artifacts we should have found here?"

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"I mean every population center on this planet was deliberately obliterated so we would not be distracted from what we are intended to learn from this set of structures."

Verrons recoiled from Heller's visionary vehemence and paced down stone steps.

Balsky shared his unease. "Isn't it possible the complex was never furnished or used due to the outbreak of hostilities?"

"Possible." Any number of things were. "Meanwhile we have a handful of aborigines with metal—we think—flutes and a lot of empty stone."

"Sufficient," Heller pronounced crisply, hoisting chin. "We will return tonight to observe the group during its waking period. You will accompany us, of course, Commander."

Verrons gnawed lip. "We'll come." He led way back to the courtyard and studied it. There was no cover. Nor was there any overlooking structure. "We could simply establish ourselves here before dark and wait. There's a chance the abos will consider that aggressive and retaliate."

"Hardly a serious threat. We saw no weapons in their sleeping grounds."

"And no flutes either."

"We have stunners," Heller declared staunchly.

The three men reboarded the hoverscooter and lofted off the mesa. They were briefly suspended in late afternoon sunlight. Upon the mesa, the temple complex floated, flistening, enigmatic.

II

NEAR dusk they ascended a gully that mouthed near the encampment. When dark came they huddled in a corner of the courtyard, stunners at hand. Balsky's breath rasped. Heller's was a dry whisper. Neither moon had risen.

They heard bare feet on stone. The first humanoid appeared. He paused at the courtyard door, gaunt, hunched. Dull eyes found the human intruders. Lip-veils quivered weakly. Warily he sidled into the yard and hunkered opposite them. Gaze fixed, he raised a forked hand.

The flute he held was gracefully formed, its metal barrel ornate and untarnished. The aborigines' nostrils flared. Lip tissues rippled as he mouthed the instrument. The flute yielded a tuneless sigh.

Others followed. Finally all five hunched, dull eyes fixed on the humans. They mouthed flutes tunelessly, dark spittle stringing down through fluttering lip veils. But by that time Verrons was little aware of the unprepossessing mien of the players. Because as flutes sounded another presence was in the courtyard.

It came as a cloud of light that

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gradually brightened until it filled the yard with soft, shadowless radiance. As it brightened, metal flutes glowed. Verrons watched bony fingers grope aimlessly up and down luminous instruments. There was neither order nor beauty in the sounds produced.

Yet those sounds somehow caused the cloud of light to birth a single tenuous light-presence. It darkened slowly from the heart of the cloud, taller than human or aborigine but similar to both in form and proportion. The presence glimmered across the courtyard, radiantly blue, its natal cloud luminous about it. It bowed before the huddle of aborigines, extruding long arms of blue light that it slowly wound and wove about itself and reincorporated. Then long arms rippled free again. The apparition arched into the air, threw itself backward and cartwheeled about the yard, passing easily through humans and aborigines, light-limbs flickering.

Flutes continued to sound. The apparition flung itself erect at the center of the yard, light-limbs spiraling around its body. Helplessly Verrons was drawn into the vortex, his consciousness absorbed and irradiated. Then the first moon appeared above the courtyard wall, a flat white disk. The apparition at the center of the yard brightened visibly, changing form.

The guise it assumed was flame—licking arms, surging head, consuming maw. Initially it was an intense blue flame that seemed to flare from a rupture in some other dimension. Then it spread, brightening fiercely. Verrons groaned as fiery arms licked him. Desperately he tried to gain his feet, a silent scream filling his mind. Balsky grunted in agony beside him.

An eternity later, when both moons hung halfway up the sky, flame drew back and began to spin, drawing fiery arms after it until it was a brilliant wheel that spun around the yard. And as it whirled, fiery red became orange, orange yellow.

Reaching the end of the visible spectrum, the progression of color was reversed. Verrons tongued dry lips. With effort he extracted one corner of consciousness from the dazzle of light. "Balsky."

Balsky did not respond but Heller retained articulacy. "Verrons—what is it?"

"It's—" Verrons had no answer. It was a wheel of light. It was turning, drawing his awareness back.

Reclaiming it.

And then the wheel began to to fade. Verrons shuddered, the ragged sound of flutes swimming back into his ken. He peered around, eyes burning. Only a diffuse cloud of light remained in the yard.

The tallest aborigine sprawled forward, head touching pavement, flute still clutched in his forked

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hand. His fellows stared at him, their own fading instruments forgotten. One reached forward and jammed the flute between his quivering lips.

Play! The word was a silent scream in Verrons' mind. His mates battered the exhausted flutist with brutal hands. But he did not respond. Flutes lay silent on stone. Light died.

VERRONS shuddered to full consciousness and gained his feet. Heller followed suit, springing away. Verrons slapped Balsky urgently, maneuvered him up and steered him around the cluster of aborigines and into the plaza. Overhead the moons were haughty white twins. By the time the three reached the gully, Balsky moved under his own power. The gully was steep, shadow-choked. "Can you make it?"

Balsky's bald scalp flashed affirmative. They bumped down the ravine. Heller emerged last, springing up in battle stance. "Commander—"

Verrons shook his head. "Keep your stunner ready, Professor." He sought bending stalks for threat.

They reached camp without incident. Pole lamps glowed, competing with moonlight. Their own brand of reality was reassuring, tent panels rustling, young voices in conference from a nearby tent. From above the sound of flutes resumed, thin and disorganized. "My tent," Verrons said brusquely, leading way.

Verrons kept a small flask in his case, one he had filled two years ago near the center of the galaxy. Now he decanted three drops of pale liquid into the lid of the flask and inhaled. The liquid evaporated instantly, creating a brief pungency in Verrons' nostrils. He proffered the flask. "*Didion?*"

Balsky accepted and followed Verrons' example. Heller was dubious. "What is the effect?"

"It smells good. Sometimes it brings on the smarts."

"An intelligence booster?"

"A temporary stimulant." Unfortunately Verrons' system rejected the effect tonight.

And Heller declined frostily. "I don't see the need."

Verrons returned the flask to his case, shrugging. But Balsky seemed brightened. His bare pate crawled. "If you will reconstruct the interior of the grand temple, you'll remember that we saw the wheel of light motif there this afternoon. It was a prominent theme in the geometric pattern that covered the interior surface of the dome. So if the wheels of light appear on the dome, couldn't we anticipate seeing other components of the dome pattern played out in light, too? If we were rash enough to return to the courtyard?"

"You feel that would be rash?"

"I'd be very reluctant to re-expose myself to the experience

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without understanding it. I'd want to know if what we saw exists in an electro-physical sense or if it was purely an event of the nervous system. And there are a dozen other possibilities I'd want to explore." Balsky raised plump shoulders apologetically. "But we're not likely to learn much without going back for an encore. Have you encountered anything like this before, Commander?"

"I'm afraid my circuit runs to hungry vines-and Class Nine ruins, the kind you approach with a tender touch and a lot of imagination." Verrons paced the small area. He had, in fact, warped here equipped with a standardized set of responses. Now he would have to retool.

Heller's lean body flexed aggressively. "Well, I will tell you this, Verrons. We may have been the subjects of brain center stimulation or we may have witnessed an actual event. In either case, it will be necessary to confront the event again. And when we do, I want those flutes in our hands."

Verrons' brows went north. "You want us to blow the flutes?"

"Do I have to say it twice? Did you relish being manipulated by savages?"

"I had the impression they were as much in the grip of the thing as we were. And I certainly don't want anyone putting lip to flute before I—"

Heller's stringy forearms bunched. "Verrons, I didn't travel this far to be balked in my purpose."

Verrons bristled. "Oh? And what is your purpose?"

Heller's gesture was slashing, all-inclusive. "To add to our race's knowledge of other races and other times, to participate in the revelation of the evolutionary plan that does exist and does encompass us all. To—"

Verrons shook his head. "Professor, no privately funded study party is allowed access to any peripheral world without escort of a Surface Commander commissioned by Service Central. In this case, me. While I have no authority in the area of your researchers per se, I carry full authority in matters related to survival. If you contravene my orders you can be convicted of mutiny when you warp downline to Earth."

"I doubt that!" Heller whipped around and plunged from the tent.

Verrons turned back to Balsky, bemused. The plump professor's face had grown crazed with fatigue. "Another jolt, Professor?"

"Not tonight, Commander." His voice was faint.

THE next morning Verrons led the entire group to the mesa top. Heller flared a taut gaze over sunwashed stone. "Commander, I would like to examine the courtyard again."

Verrons remanded the party to Balsky's custody and accompanied

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Heller. In the small courtyard they found waiting stone, nothing more. Heller scanned the yard fiercely, then stalked away.

Verrons followed. Heller strode the plaza to the arcade where Balsky had gathered the party. By the time Verrons caught up, the professors had already conducted the group into the first of the series of ascending temples. It was not until Verrons passed under the portico that he realized an event was in progress.

Within the temple, the party was frozen. Verrons' gaze darted to the point of their converging gaze. From the polished stone floor, a substantial rectangular block rose. It elevated until it stood somewhat higher than human eye level. A diagonal grain marked its lateral surfaces.

Verrons reaction was swift. His stunner came to hand. "I don't want anyone to touch that stone."

Heller's eyes darted to his, hawkish. "You—"

"No one!"

Slowly the end portion of the block slid inward. From the interior of the block, a dark rectangular object slid gently to the floor. Verrons lunged to squat over the object. His fingers tasted smooth surfaces. The object appeared to be a case.

The stone block withdrew into the floor. Verrons hefted the case. It was moderately heavy. "I'm going to take this to the plaza to open it."

No one objected. Outside he kneeled in sheeting sunlight, the case shaded—and shielded from the party under the portico. He pried at its seams. It opened easily and he stared down at a double rank of ornate metal flutes—fourteen altogether.

And fourteen people waited under the portico. Verrons rose slowly, shaken. Sunlight fingered the flutes and splintered brilliantly.

"Well?"

Verrons gestured them near. "This is what we draw. And I still don't want anyone to touch."

The party encircled the case. Heller counted and bared challenging teeth. "Well, Commander, it appears we've each been allotted a flute—except you. Is that some indication of your status with the local powers?"

"It's more an indication of the fact that I wasn't within the structure when the mechanism initiated its cycle, Professor."

Heller's brow arched. "Then you do concede that it is not pure coincidence that there are exactly fourteen flutes here."

"I don't concede anything. We're not staging a debate." Verrons snapped the case shut. He catalogued the party. Yesterday he, Heller and Balsky had received no such thoughtful offering. "Winchell, Olsen, Gomes—come with me. The rest of you wait here." Taking the case, he led the three

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back into the temple.

Inside they waited expectantly. The temple made them no offering. Verrons grunted. "Olsen, go fetch one more."

She pattered away and returned with Arguilar. The four regarded Verrons alertly. Still the temple did not yield. "Another."

Four assistants later they were still unrewarded. Verrons paced off the section of flooring that had risen before. The seam was barely perceptible. "I could have sworn we had a pressure sensitive floor here, one discriminating enough not to respond to individuals or very small groups. Now how much does it want before it produces?"

"Commander, maybe it knows we're carrying flutes already." Olsen indicated the case in his hand.

"Ah. Let's check. Take this case to Balsky and come back."

She obeyed. And the stone block rose from the temple floor again. Grained lateral surfaces shone richly. Slowly the end panel slid up. The block birthed a second rectangular case, smaller than the first.

Verrons opened it quickly, grimly. There were nine flutes, one for each person in the temple.

"Now that's a pretty intelligent mechanism," Winchell commented, squatting beside Verrons.

Verrons met clear green eyes set in a solid face. "Very." He chewed cheek, debating. He did not want anyone setting lip to flute before he did. Neither did he care to spend the day encumbered with superfluous cases. Quickly he instructed Olsen again. She took the second flute case and withdrew to the portico. A moment later she reentered, hands empty.

When the stone block began to rise, she retrieved the second flute case. The end of the block slid open and Verrons was ready. Before the mechanism could disgorge a third case, Verrons jammed the second back into its maw.

He half-expected the effort to fail. But the block accepted the case, reconsuming it along with the case it had intended to deliver, and withdrew into the floor. Relieved, Verrons shooed everyone from the structure.

Heller's thin mouth twisted. "Now presumably we can see what other structures have to offer."

"I'm hardly finished here." Verrons selected assistants again. "I'm going to step back into the temple. Follow one at a time, at sixty second intervals, until we see how many of us it requires to trigger the dispensing mechanism."

Seven minutes later he had his answer. It required six persons. He retested, selecting and sequencing to obtain a lighter mix. Again the temple responded when six members of the party had gathered. "So it's not sensitive to weight, but to the number of individuals. Now we'll have a look uphill."

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The second, third and fourth temples proffered flutes. Verrons refused delivery. "Obviously they were meant to be played. But whether the race that built the complex intended them for its own use, for the aborigines' use—"

"I don't see how you can suggest they were intended for savages," Heller argued immediately.

"They have oral cavities, don't they? They can direct an air stream through the barrel of the instrument. They may even be descendants of the race that built the complex."

"I certainly don't conceive of the degenerated aboriginal specimens we saw last night as either the authors or the intended clientele of this establishment."

"Then what *is* your interpretation of the situation?"

"First I suggest that an establishment of this complexity was not erected here by chance. There is purpose—beyond the merely local. And since we are the ones who have arrived, I suggest that the establishment was placed here for reasons related to our coming, to convey a central truth to us."

"Oh? To all of us—or to you in particular?"

"To whichever of us is ready to recognize the truth."

"I see. But if each recognizes a different truth?"

"Then most are misled by inadequate powers of comprehension."

Verrons studied the lean face. Could his own inability to patter through such airy intellectual constructs be construed as a deficiency? Or a saving sanity? He shrugged. "Let's move."

The next two temples offered flutes on the same terms as before. When they reached the third, the central block did not rise from the temple floor. Instead it slowly recessed and moved aside, revealing a square opening.

"Back." Verrons approached cautiously. Light glowed alive below. He looked down a metal ladder into a narrow corridor. He bent. Corridor walls were polished metal, the floor glazed stone. Both were otherwise featureless. He stood and stepped away, face grim.

"Look."

Heller kneeled and peered into the opening. When he stood his hazel eyes were inflamed with portent. "Obviously there is an extensive substructure here, Commander."

"Obviously."

"And just as obviously you do not intend to permit anyone to descend."

"You're so right—not today. If there is a grand plan we'll fulfill it soon enough."

"You know, the entire mesa may be hollow," Balsky suggested.

"It could even be an artificial land feature," Winchell speculated, "specifically constructed to house storage."

And to elevate the temple com-

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plex into greater prominence, like a piece of bait? The entire establishment, exquisite, empty, began to feel to Verrons like a mousetrap. He turned to confront questioning eyes. "I want to make myself clear. I'm not being obstructive when I refuse to allow anyone down that ladder today. I have to do some hard thinking. Because when we do go, we go to learn more about this specific situation, not to expose ourselves to the revelation of any great truth, human, alien—or universal."

Heller's lips whitened.

The party proceeded. Successive temples opened to further stretches of underground corridor. In the grand temple, beneath the complexly patterned surface of the interior dome, a broad stone staircase with carved railings led down. Verrons eyed the stairs stonily. He did not appreciate structures that snatched the initiative from the explorer.

"Commander, do you still want sketches of the interior dome surface?"

Verrons stepped back. His eyes panned across the dome. "And photographs."

Waller and Gomes unpacked paraphernalia and undertook to oblige him.

III

THE party returned to camp in late afternoon. Verrons did not stay to sample the postprandial analysis of events. He snatched a quick meal, reiterated instructions that no one was to leave camp and moved through the jungle, flute case under arm, toward the aborigines' wallow.

When he did not locate them there he tracked them downstream and into the jungle. They fed noisily in the shaded dusk, tearing down branches of fruit and berries, stuffing horn-lined mouths with brute concentration, grunting and mumbling. Juice, yellow, scarlet, strung through violet lip veils and puddled on gaunt chests.

They fed until their lean bellies bulged tumorously. Then they hiked upstream, shadowy faces stuporous. Near the mouth of the gully, two kneeled and rooted at the base of a husky brown stalk. They unearthed a case similar to the one Verrons carried. When the case was reburied, the group stumbled into the gully, flutes in hand.

Verrons waited before following. When he reached the plaza, flutes already sounded across the complex. Verrons strode away from the sound. Night lay bright across shimmering stone. Twin moons hung over the resplendent pink shoulder of the grand temple.

Within the grand temple, the stone floor glistened palely. Overhead the interior reaches of the dome were shadow-shrouded. Verrons' footsteps echoed as he moved along the wall and sat. Bracing

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himself against cold stone, he opened the flute case and selected an instrument. It was little more than an ornate barrel with finger-holes, a mouthpiece at one end, a flaring belled extrusion at the other. The metal barrel was cool. Experimentally Verrons touched lip to the instrument and blew.

The air clouded brilliantly before him. Verrons raised his head. The figures on the dome surface took fire and began to move, wheels of light rotating, geometric forms changing, color and line merging and flowing with hypnotic sinuosity. Staring up, Verrons was barely aware of the instrument in his hands or of the breath he nurtured it with. He was aware only of the writhing ceiling and of the slow resolution of cloud-brightness into light-being.

This was not the featureless blue being of the night before. This was a golden creature who draped herself in the remnants of her natal cloud with a graceful sweep of long-fingered hands. She moved across the floor on long muscular toes that splayed from the tapered ends of her bare legs. Her drapery of light concealed nothing, but her body, a sweetly modeled sheath for her being, was in turn marked by no suggestion of profane function. Her face—vertical eyes, arching mouth—was a compelling composition of golden light. A separate cloud of light enveloped her head, iridescing faintly.

Verrons continued to flute. Overhead the inner surface of the dome had become as broad as the sky, as deep—and suddenly as dark. Light-wheels spun from the dome surface and arched down through forever, fusing the air. Luminescent geometric figures flowed after, cascading in brilliant confusion.

Chaos engulfed Verrons. His flute glowed with colors he had never seen before, colors he did not see now but felt in his burning fingertips. From the depths of confusion, Verrons' golden creature arched and sprang upward. She arrowed sleekly through an eternity of dark space, flexed her body and flattened herself across the distant black surface of the dome, arms and legs elongating. She hung there, dimming, becoming tenuous. Then she resorbed her fading limbs and contracted until she was a gaudy yellow sun in a black sky, burning. Suddenly her limbs exploded outward again. Rippling, she launched herself downward, swimming air to where Verrons cowered.

He was overwhelmed by darting light figures. The golden creature swooped to penetrate Verrons' chest and disappeared into the temple wall behind him. Swiftly she emerged meters away. She swooped up again, threading the living forms upon her arms, ordering and taming them. With them she created a pyramid in the air. Then, with a sweeping motion, she di-

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rected them back through the air. They flattened against the surface of the dome, surrendering motion.

She flowed near. Her words were blown into Verrons' mind. *I live again in the precincts of your power.* Muscular toes arched and curled. Fingers rippled air.

Verrons struggled to form words of his own. Instead the sound of his flute increased in volume.

She brightened, her features becoming distinct. *I waited in the matrix of light. I waited to live in your power. Now it moves me.* Eagerly she arched backward.

Unexpectedly a second cloud appeared. Surging brightness condensed into a second being, dark, violent, his body powerful. He moved on long, thick toes, gathering the remnants of his cloud around him. Then, flexing, he cast himself straight into the air, spinning swiftly.

Verrons heard a gasp. Winchell crouched over the flute case, glowing instrument pressed to his lips. Verrons stared at the young assistant helplessly, unable to move.

A faint remonstrance. *I waited.*

Distracted, he had let the flute slip from his lips. His golden dancer dispersed into mist. Verrons jammed the instrument between his teeth and exhaled with will. She flared bright, her eyes suddenly glowing green. Exultant, she sprang again, tossing herself up—

—and into the spokes of the violet wheel that flashed across the temple dome. Quickly she arched her body to form a second wheel. Together they spun through the air, feature and limb obscured by the fiery speed of motion.

As the two wheeled through the reaches of the dome, Verrons became aware of a third light entity, the blue being of the night before. It precipitated from the air, flared brilliantly and flung itself into union with the other two.

Verrons pulled his glance aside. The five aborigines crouched two meters away. The tallest blew his instrument intently. The others cradled theirs. Light—golden, violet, blue—reflected across the surfaces of their eyes.

After a time the three entities separated. Verrons' resumed original form and swooped through the stone above his head, to reappear from the opposite wall of the temple moments later. She glided to a halt before him. *When I had flesh, I ran the stones on toes that flexed like springs. I flew with sparks in my hair and between my eyes I wore a jewel that caught sunlight and made it a cleaving sword.*

Verrons' mind was lanced with intense light. Into his consciousness flashed a vision that raced stone pavement, a crackling mane sparking behind her. She tossed back a glance and he knew the line of mouth and eyes. But now she wore flesh instead of light, her body

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supple and brown. When she turned again, her eyes were as green as the flashing jewel recessed into the flesh between them.

WITH a leap she soared into the air. They rode above a city of glassy structures set in aprons of stone plaza. At the edges of the plaza, jungle crawled dense and wet. *I flew. But my powers were unmatured. I sank down again, unsatisfied.*

They did sink. Muscular toes touched stone. *But I knew my power would strengthen, because my line is strong. My male parent crossed the tangles and the deserts many times and returned with fire still flashing in his jewel. My female parent rode the high strata, a flesh-deity, until the day she was caught by storm and torn to her death. I knew it was in my line to soar the sky.*

I flew. Again she launched herself. This time their journey was longer. They darted on invisible currents, her sensitive fingers tasting air, her hair crackling as she swung it around her shoulders. They soared across the city, reached the jungle's edge and swooped high. Trees grew small below. Suddenly, fiercely, she arched her back and dove.

They accelerated crazily at the treetops. Verrons' flute uttered a harsh note. She swooped up again and arched through a puffy white cloud. Then she dove again, this time carrying them to rest at the edge of the city.

I flew. But I walked too. My feet carried me a seeking course. I tasted, I smelled, I looked, I touched. My hair caught current from the air and transformed it to fire and my powers grew. I was a force in my time.

Verrons was drawn into a whirl of activity as she flung through the city, testing and examining, trying and discarding. In her eagerness, she seemed to bounce off her world, leaping from situation to situation. Verrons saw color, saw pattern, saw objects and structures, saw others of her kind. But she moved too swiftly for him to resolve anything into detail.

I was, she echoed in his mind. *And now I am again. I take life from your power. I leap, I fly.*

She leapt. She was briefly suspended against a background of brilliant light. Then she began to recede until Verrons held her at a distance, an apron of darkness wide around her. She stood, hair crackling, her arms thrown back to embrace a giant crystal. Throwing her head back, she faded against the crystal, dissolving into it until she was no more than a golden gleam somewhere deep beneath its flashing faces.

Then she emerged again. But somewhere within the crystal she had shed flesh for light. Her hair was a cloud of radiance. *I am!*

She was. She arched about the

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dome, flashing through darkness like a manic sun. Then she swooped back. *When I had flesh . . .*

Verrons followed her back through the crystal into flesh again. He lived with her her urgent search for a mate, her frantic sorting and testing of males, her ultimate selection. Then two brown bodies arched the skies, darting and racing, green jewel and red flashing. Wind-torn deities, they mingled crackling manes and joined arching bodies. Then they parted, returning to their separate lives.

Verrons lived with her the months she carried the products of conception. Then he fled with her to the stone cavern where she ripped her four young from her own dilating cervix and hissed first life into their gaping mouths. He emerged with her when all four breathed and whisked with her to find an underling to suckle and tend them.

They grew. First hair appeared, but only one of the four sprouted a crackling little mane of power. The others grew hair silky and limp. She flashed the clouds, venting her fury upon the air. Then she tore to a dark quarter where she abandoned her ungifted three. She darted away without looking back. *Let whatever scuttling little person wants them claim them. Let them be reared to sweep and clean, serve and tend. With their dead hair and their powerless minds—they are none of mine.*

She bore her remaining daughter into the clouds. Child in arms, she cometed the sky. When they returned her daughter's eyes glowed red. That was the color of the jewel that was recessed into infant flesh upon the anniversary of the birth. *And I bore my daughter up and taught her. And power flashed between us, an enduring umbilical . .*

Verrons followed her through subsequent years, through the quests and victories of her ever-developing power. He conquered with her that portion of her world she claimed as her own. Scuttling little people, brows bare of jewels, hair lifeless, swept and cleaned and tended and served—and when she flashed green fire into their weak eyes, they cried and begged to serve some more.

When I had flesh . . .

As she flung through the years, Verrons' strength waned. The sound of his flute grew ragged—his body became numb. But there was no way to communicate his exhaustion to her. Finally she lived in a single dim chamber of his mind, flying, commanding, reigning, surging, a force in her time. Doggedly Verrons supplied the flute with breath.

Finally even that last lighted chamber of his mind darkened. His limbs laxed. The flute fell to the stone floor with a clatter. Verrons slumped unconscious.

Time was a well—deep, black,

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inescapable. He struggled mindlessly against its dark walls. Much later he returned from a distance, Winchell's voice urgent. "Commander! It's light. We have to get back to camp."

Verrons opened unfocused eyes. He lay on his side on cold stone, muscles unresponsive. With Winchell's help he sat. His flute lay near. Possessively he closed fingers around its cool barrel. "How long was I out?"

"I don't know. I—the aborigines took four of our flutes. Out of our case."

Verrons groped across the floor to the open case. The aborigines had abandoned their own instruments nearby.

"I didn't try to stop them. I—I wasn't much better off than you, except I had my eyes open. They had to carry their lead man away, the big one who was blowing the—the blue."

Verrons nodded numbly. "Same one fainted first night." He crawled across the floor and examined the abandoned instruments. His muddled mind produced one coherent thought. "Dead."

"What?"

"The abos left them—because they're dead. The flutes, I mean—worn out. Lost their charge. Whatever. That's why—" His voice dribbled away.

"That's why there was only your golden dancer, my violet one and the blue," Winchell said, green eyes sparking with comprehension. "And with only five in their party they couldn't key the mechanism to issue new flutes."

Verrons nodded. Slowly he came to his feet. "We'd better get downhill before they send searchers."

Winchell's features were suddenly anxious. "Commander, when I came up last night I only intended to observe. I didn't—"

"Forget it." When they reached the plaza, Verrons stared toward the single crater on the horizon. Perhaps it marked the city from whose stone pavement they had soared into the air. Perhaps those distant trees were descendants of the ones they had almost intersected in flight. Certainly this sun, rising . . .

His hand tightened on the flute. He had walked half a hundred worlds in the course of his career. He had never before risen and looked over one as alive as this one today.

Even with its former inhabitants dead.

Dead?

"Commander?"

Verrons made the long journey back to the present and accompanied Winchell to the gully. "A few days sleep—"

"We might grab a few hours if we slide in before anyone wakes."

They succeeded and Verrons fell across his cot. He slept dreamlessly, unresponsive to the wakening sounds of camp.

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A FEW hours later he was roused by a more urgent stimulus. He staggered up and plunged out, gripped by an agony of hunger. Rubber legs carried him to the dining area, where one of the cook shift made advance preparations for the noon meal. Verrons communicated his need and the assistant raided a storage box for him. When Verrons had eaten, sending back twice for refills, he slumped across the table.

He was next brought to by an aggressive throat-clearing. Heller. "Commander, it was my understanding that anyone who disregarded your orders about remaining in camp last night would be charged with mutinous conduct."

Verrons' tongue responded thickly. "I've appointed Winchell my special assistant. For the duration."

"Oh? I'm surprised you didn't tell me before now."

"So'm I," Verrons responded obdurately.

Heller's hazel eyes narrowed. "Well, I assume you have had time for whatever thinking you consider necessary before permitting us to enter the underground facility."

Blackmail. Verrons sighed. "We'll go after lunch. I'll take Winchell below as my special assistant. You can choose one of your people." His chrono communicated a welcome fact. He had an hour and a half to sleep before he mounted the gully again.

He woke only when Olsen assaulted him with a wet towel. "Commander, Professor Heller is very agitated. You're half an hour late."

Verrons sat up dizzily, his head refusing to clear. Before he was made sufficiently alert with a chemical boost from the med kit, he was later still for his appointment.

Heller greeted him sternly. They ascended, the gully seeming to loom into Verrons' consciousness from another dimension, neither quite real nor illusion. His feet suffered the same malady.

He steadied when faced with the staircase that led to the corridor beneath the grand temple. Moments later he stood below with Winchell, Heller and Nevins. Before them stretched glazed stone floor. At first glance the corridor appeared to lead only to a blank wall. But before they had taken five steps, paneled walls glided aside and they stood in a chamber of the same proportions as the temple above. The ceiling was low, illuminated by glowing panels.

Verrons' head snapped around. His gaze traveled sixty degrees and was captured by a life-size figure of stone. Long and brown she stood, head raised, blue eyes cast up. A blue jewel was recessed into the flesh of her brow. Her long arms were flung backward around an oblong multi-faceted crystal as tall as she. She grasped the stone floor with muscular toes, ready to spring.

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Verrons was drawn. He stared up into her stone face. The questing spirit captured there was familiar. The individual features were not.

"Commander—around here."

She reappeared on the opposite face of the crystal, this time vividly blue, her body subtly contoured to suggest energy flow. Her arms reached upward. The air around her head was softly illuminated. Verrons gazed into her transformed face, mouth drying. "Winchell—last night, did you see anything like this?"

There was brief reticence in Winchell's clear eyes. "You mean passage through the crystal from—from one state of being to another?"

"Passages from states of being?" Heller's ears fanned from his skull as he descended upon them. "Just what *did* you learn last night?"

Reluctantly Verrons related his evening's experience, watching it filter through Heller's charged brain and emerge transmogrified. When he had finished, fiery eyes flashed to Winchell.

Winchell related his own experience. "I think the crystal passages were symbolic, Commander, a stylistic device for leading our awareness into the past and back again. I never saw the giant crystal except at those transitions and evidently neither did you. But later—after you passed out, I guess—when I followed my being all the way to the end of his life, I saw him take a small crystal identical to this large one into his hand. He had gone to what he called the dying house and the crystal was brought to him. It was about half the size of the first segment of my little finger. He held it in his hand and—he died. The attendants returned then and opened his hand and the crystal had changed. There was a violet spot at its center—that hadn't been there before."

"And you don't consider *that* symbolic, a stylistic device?" Heller demanded.

WINCHELL's green eyes were troubled. "I don't know. He—he didn't explain fully what was happening. Maybe the crystal was just a device for registering death. Or it could have been a communicator to summon the attendant. Or it could be that when he died, something—some electrophysical expression of his personality—passed into the crystal. A—a soulprint, you might call it. That's what I think happened."

Heller's eyes flashed to Verrons, incandescent. "Commander? How do *you* interpret what Winchell witnessed?"

Verrons shook his head. He wasn't venturing interpretations until he had taken the journey into her life again, until he had followed her down the passage to her own death . . .

. . . *tonight? Did he want to live her death tonight?*

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But it would not be final death, not while he held her flute in hand, her Lazurus-factor.

"Surely you have formulated an interpretation, even if you don't care to share it?"

"I suppose you have, too, Heller." *From your complete dearth of knowledge . . .*

"I most certainly have. The race that created this complex was obviously in possession of very unusual powers—powers we humans have dreamed of for centuries."

"Provided last night wasn't just flute fantasy."

"Neither of you has presented it as such. These people were able to draw the sun's energy through crystal forms implanted in their flesh. They were able to levitate and to fly for considerable distances. In their later lives they exercised control over inert objects and over the ungifted members of their own race. And now you understand why we have been brought here, don't you, Commander?"

Verrons glummed at the floor. "The grand design?"

"Exactly! We were summoned to become the next race to gain the powers these people held. We have been chosen, of all the races in the galaxy, to take the next step up the evolutionary ladder."

"Then where do the aborigines fit? Don't you grant them any credibility as descendants of the race that constructed the complex?"

"How could they be? Do you see any physical resemblance—beyond the fact that they're humanoid?"

"Mutation. The globe is dotted with nuclear craters." The argument was unsound, he knew. The craters were scarcely old enough to have permitted mutation through the inevitable period of genetic chaos and then reconsolidation into a single homegeneous race. He swung on Heller aggressively. "Then if you're determined they're of different stock, why isn't it their destiny to be the next superrace, Professor?"

"Obviously they're too primitive to make the leap. There is too much developmental ground to be covered. They can't even be classified as stone age—we've seen no sign of tools or weapons. Although, I suppose, if the superrace were physically present to guide them—"

"The abos come up here and toot flute every night."

"That obviously isn't sufficient. They don't have the intelligence to question, to seek and probe."

Verrons abandoned argument. Glancing up, he caught a ring of intent faces at the head of the stairs. "If we're going to seek and probe, we'd better move."

IV

Two additional stone and crystal tableaux occupied the large chamber. The party examined them cursorily while Verrons paced

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the walls of the chamber. He had covered barely a quarter of his route when panels slid and he looked down a gently sloping corridor.

The others joined him. "Before we go I want to locate all the exits from this chamber and sketch them for reference."

They found three additional exit corridors. They entered the last and the wall behind them closed. Simultaneously walls either side of them folded away. They stood on a ramp in a second large chamber. Verrons scanned their new surroundings. The chamber floor was set with compartmentalized display cases. Within each sealed compartment reposed a single glistening object.

Professor and students launched themselves with glad cries. Only Verrons reacted with choler. For seventeen years study parties under his guidance had chipped and prayed after their precious finds. Here everything was considerately presented in glass-sided cases. The analogy of the interstellar rodent trap twittered to mind. Verrons wriggled his nose suspiciously. His littermates scuttled for the cheese.

Succulent cheese it was. They were offered a well-arranged collection of art objects, fragile bowls and veseels, containers intricately wrought, delicate implements, objects woven of gleaming wire, jewelry massive and grand.

And this chamber was antechamber to still another elaborate display room. Which in turn gave way to another and another.

But the collection, exquisite, extensive, quickly proved finite. Two hours later they found themselves in a chamber that connected only to the one from which they had entered. That chamber in turn connected only to two other cul-de-sac rooms and to the larger chamber from which they had entered it.

When they had exhausted all possibilities Heller flashed hawkish eyes over Verrons' sketch pad. He compared it with the companion map Verrons had rendered of the surface features of the complex. "If you have proportioned these maps correctly, there is an entire underground area we are unable to reach, Commander."

"Where else do you think they put the flute dispensing mechanism and related storage?"

"Ah—of course. But presumably there is entry to those chambers, through apparently we won't discover it here." His eyes flashed over their surroundings. "What do you think of all this, Commander?"

"Very pretty."

"And totally useless. There is nothing of practical usage here and nothing suggesting or depicting day-to-day life. Nothing to tell us more than that the people who assembled this collection included some very gifted artists and craftsmen. Have you any idea why the collection should be so limited?"

"I haven't given it thought."

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"It is limited, obviously, because it is only intended as a brief concrete sampling of their abilities. The rest we are intended to learn through the flutes."

Verrons shrugged. "Granted."

"Then you don't intend to obstruct us from coming to the complex as a group tonight? The experience obviously did you and Winchell no harm."

Shrugging again, Verrons abdicated sole proprietorship of flutes.

"And now that you've inspected this area, you won't object to my sending a party down tomorrow to photograph and catalogue."

"Not if we make it out in good shape."

"As we shall."

Ladders were strategically placed When they set foot to rung, the ceiling produced passage. They mounted and emerged.

IT WAS dark when Verrons woke again, anticipation a heady surge in his blood. Sitting, he uncased his flute and stroked its cool barrel, briefly victim of temptation to breathe life to it here and now.

But this was not the place.

Nor, he decided when the party reached the mesa top, was the grand temple. Not tonight. The remainder of the party trekked there, footsteps hushed on shimmering stone. They single-filed into the structure, spread along the walls and sat, silent, hesitant. Flutes were distributed from cases—they had drawn a second case to replace the flutes taken by the aborigines—and came self-consciously to pale lips.

And Verrons didn't want to share light with them. He slipped from the temple as the first tentative notes sounded. Quickly he loped down stone steps. He took her to a small temple that bore twin moons in its arched window. Hands quivering, he brought flute to lips. He tongued the mouthpiece, drew breath and blew.

And nothing happened, nothing beyond a faint haze that draped dolorously in the air. Disconcerted, Verrons blew again, his fingers picking out a simple tune no one had ever heard before.

No one heard it now. No one but Verrons squatting alone in the chill temple, his lips suddenly cold, twin moons gliding icily across his glazed retinas.

Did she demand the company of her kind? Verrons thought not. But when the hands of his chrono measured a leaden quarter hour and his breath produced nothing but mist, he creaked to his feet and measured tread to the grand temple.

On another night the hypnotic tumult of light might have claimed his awareness. Around the walls of the temple humans and aborigines squatted will-less, glazed eyes reflecting radiant chaos. But Verrons was not dazzled. Stiffly he sat. Muscles clenched in anticipatory

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agony, he placed his own flute to lips and blew.

She did not materialize. There was only the limp curtain of light he had blown in the lesser temple, forlorn, barren.

Later he barely remembered his staggering journey back across the complex, his perilous descent of the gully. In his own tent, by lamplight, he found the flute's seams.

A complexity of miniature elements occupied the metal barrel: ceramic units, gleaming wires—and a single white crystal, half as large as the first segment of his little finger, at its depths, a golden speck. *His dancer.* But the crystal was shot with fracture lines. When he probed it splintered.

Shattered. Verrons shook bright shards into his palm, loss claiming him. A soulprint etched in crystal—an electrophysical expression of the personality, captured at the moment of death and preserved—but in a medium fatally fragile. He had resurrected her to dance a single night. Exhausted, he had dropped her to the pavement. The clatter of flute on stone echoed in his mind.

He closed his hand around sharp fragments. Verrons left his tent and slipped into the night jungle. The sound of flutes from the mesa laced the night. He emerged at streamside, the smell of mud thick in his nostrils.

I flew with sparks in my hair and between my eyes I wore a jewel that caught sunlight and made it a cleaving sword. Now she cried to light the upper atmosphere with a final crystalline surge. It was gross injustice to lay her to rest in the jungle.

Then he saw the shimmer of twin moons on the surface of the stream. His body tightened. With a flick of his wrist, he committed her to rest. She broke silvered water lightly. Twin disks rippled briefly and she was gone.

Gone from the night, gone from the world. Verrons moved through an empty jungle to a barren tent. He lay staring at an inner play of light, his hands clenched tightly on nothing.

IT WAS dawn when sounds wakened him. He hurried to the dining area. The party had returned. With single-minded voracity they attacked the food supplies, pulling out bags of concentrate, scooping up powder and pellets with bare hands. Balsky had hauled a bag of carbo-powder to the shadow of the supply tent and was systematically packing his mouth.

Verrons located Heller at the other side of the tent, crouched with the five aborigines, spilling hi-pro pellets into mess bowls.

"You're feeding them?"

Heller's head bobbed up, features haggard. "They're starving, Commander. Feeding them could stimulate them to communicate."

"Then I hope you're prepared to communicate fast, Professor.

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You're probably poisoning them."

Heller's glance flickered across the aborigines in quick alarm. "I—" He jabbed at his hairline distractedly. "I hadn't thought of that. Their metabolisms may not be comparable to ours at all. I—" His hand quivered. "I saw opportunity. I—"

"Well, don't stop now. This may be your last chance."

Heller bobbed up nervously. "Nevins is my communications major. Nevins—" His gaze jerked back to the aborigines. They bypassed the mess bowls and upended the bag of pellets on the ground. Greedily forked hands scooped. The largest aborigine launched himself face first at the pile of pellets, lip veil switching.

Verrons yelped for Nevins. Heller and Nevins initiated a valiant effort involving the humanoid universals, hand language, body language and finally slashing in the moist soil with finger and pointed stick. "Paper would only confuse them," Nevins informed Verrons hastily. "Never employ a medium more sophisticated then the cultural level of the subject."

"In this case, language," Verrons suggested dryly. The response to Nevins' effort was unencouraging. The aborigines continued to feed, scrabbling after elusive pellets, then upending mess bowls over horn-lined mouths.

By the time bowls were empty the effort had attracted an audience. "Commander, what about the substance we used night before last?" Balsky suggested.

"*Didion?* Want to test another brand of poison, Heller?"

Heller acceded immediately.

"Then don't dole out more calories. If the *didion* takes, let's establish the condition that food is contingent upon communication. That will give us a lever."

The aborigines accepted the pale liquid readily, sniffing in turn from the vaporizing lid. Dull eyes took gleam almost immediately.

"It's working," Heller crowed. "Their brain tissues—"

"—are still computing food," Verrons snapped as the first aborigine barreled past him, lunging for the supply tent. He fielded the attempt and found himself wrestling a bony fury. The aborigine grunted fiercely, joints flexing in unanticipated directions. Fingers grappled for Verrons' windpipe. A horn-lined mouth affixed itself to Verrons' left cheek. "Stun him!" Verrons bellowed.

The other aborigines had broken the line of startled humans and tore into the supply tent. Their performance commanded more attention than Verrons' plight. "Drop him!"

Winchell seized the weapon from Heller's belt and fired around the frozen professor. The aborigine yelped and slackened. Tearing one arm free, Verrons pulled his own stunner and rendered the abo limp.

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Hand on bloodied cheek, he bounded to the supply tent to drop the remaining four.

"There is intelligence there," Heller insisted, eyes blazing, as Verrons ordered the five lax bodies dragged beyond camp.

"There's hunger there. Even a dog can find food if he's hungry enough."

"But a dog doesn't bear humanoid form! A dog—"

It was not the moment to explore cosmic implications. "If you want to try again when they unnumb, fetch a bag of pellets—one. And I want stunners at hand. These pretties have just popped up the scale from presumed harmless to potentially deadly. I don't want to drop the 'potentially.'"

The aborigines tossed off the stunner effect quickly. Nevins labored earnestly to convey the connection between the single bag of pellets and the humans' desire for communication. The aborigines responded by launching attack, battering the young assistant savagely.

When they were felled again, Verrons regarded the five lax bodies grimly. "I think we start from the top again, Heller, first getting across the connection between their aggressive tactics and all-all-down. Then we move on to food-communication."

Heller nodded haggardly. "Perhaps the *didion* stimulated aggressive instincts rather than true intelligence," he admitted.

"And maybe when you're starving, aggression is the intelligent response."

But when the aborigines revived, the effects of *didion* had visibly ebbed. They huddled, gazes moving sullenly from stunners to pellets, lip veils fluttering. The largest took his feet, head lowered. Verrons' hand tightened on his stunner. But instead of lunging, the abo turned. His group followed him into the jungle, stalks crackling underfoot.

Heller was crestfallen. Verrons holstered his stunner. "They'll be back. So I'll keep guard over the supplies while the rest of you sleep off the big night." Turning, Verrons noted for the first time the exhaustion of professors and students alike.

His sympathy evaporated when he confronted the mess he was committed to guarding. Boxes and bags had been torn open, powders, pellets, wafers and grains scattered across every surface, including the ground. Grimly Verrons policed the area, salvaging what he could. When the place was tidied he settled in for a long dull day, stunner at hand. Shadows moved silently, stalks bending in the light breeze, green and scarlet leaves rippling. The aborigines did not return.

Not until dusk, when Arguilar summoned Verrons to the edge of camp. The aborigines emerged

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from the jungle in a group, lip veils switching. The tallest thrust his hands at Verrons.

Verrons stared at the object foisted upon him. It was a small sturdy metal barrel, both ends open, its interior surface set with lightweight metal paddles. Suspended at its center was a round instrument face marked with needled dials. The metal of the barrels was lightly pitted, the clear face of the instrument pack completely unmarked.

The aborigine gestured at the object and grunted.

"Trade?" Verrons guessed, startled. He jabbed at his mouth.

The aborigine did likewise, lip veil wagging sharply.

"Fetch a bag of hi-pro pellets," Verrons ordered Arguilar quickly. "Snack wafers too. And Heller if he's close."

Arguilar returned with all three. "They brought this? What is it?" Heller demanded.

Verrons thrust it at him. "Your guess. Ari, keep my stunner ready." He tossed the weapon to the assistant and breached the bag of pellets.

The aborigines dined with gusto, pouring out the pellets in a heap and scooping them up. They sampled the wafers and dispatched them enthusiastically.

"Offhand, I believe it's a weather instrument, Commander. An anenometer." Heller held it up. Dial hands moved as the paddles caught the breeze and rotated within the barrel.

"Sophisticated offering from this crew. And in excellent condition."

"Exactly. It's apparent from this that there are stores of artifacts we know nothing of, items that have been in sheltered storage since the holocaust."

V

VERRONS nodded abstractedly. The survey crew had reported total destruction of population centers. Not even minimal debris remained. They had not, however, combed dense jungle over the entire face of the planet. Verrons glanced up at the darkening sky. "You're planning to take the party to the complex tonight?"

"Assuredly. While we all underwent vivid experiences last night, we learned absolutely nothing of the technology, nothing of how these people achieved their effects."

"I don't think it *was* technology. The power was inborn."

"But the crystal set between the eyes was not. Nor the ones like you tell me you found in your flute. And if we can simply learn to record the personality for future reference, it will be a tremendous step forward. Can you imagine being able to walk with Socrates? To follow Newton and Einstein, Leakey and Pardini through their life's work? Can you imagine looking over Shakespeare's shoulder as he—"

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"Shakespeare is already dead. But I see your point. So uphill we go and tomorrow I'll try to persuade our friends to fetch more trade booty. But this time I'll follow them."

That night, when the party emerged from the gully, Olsen drew him aside. She pressed her flute into his hand. "I'm not going to use this again. But I think—I think you should, Commander."

Before he could question her she darted ahead like a person who has fulfilled a distasteful duty. Puzzled, Verrons examined the flute.

Winchell fell into step beside him. He indicated the clutch of aborigines trailing the party. "Commander, I've queried the entire party this afternoon. No one caught sight of their race in the visions last night."

"Oh?"

"In fact, I've quizzed almost everyone on their experiences. You know, the people who were born with the power certainly don't seem to have developed scruples to match. There were some instances of really sophisticated brutality and a lot of the other—callousness, unconscious brutality. Evidently they didn't consider the ones who were born without power as truly—human?"

"Little people who scuttled and served?" Verrons frowned. Certainly the quality of mercy had not been strained in his own golden dancer. She had exhibited little empathy for her inferiors. "Well, mark it one sign of intelligence then that the abos avoided contact."

Winchell nodded. "I guess so. You know, the abos might even have developed into an intelligent race. If they'd lasted long enough."

Verrons' sympathies were not engaged. "If the spark had been there they would have hung on."

"But the others didn't, the light-dancers and their underpeople."

Verrons grunted. "And no one caught a hint of what happened to them?"

Winchell's clear eyes flickered away. "I—I'm not sure. Olsen wouldn't talk to me. But none of the others caught anything."

"Well, we'll see."

HE SAID that without suspecting he shortly would see, when he braced himself against the temple wall, put Olsen's flute to mouth and breathed a burning red being into life. For with that fiery vision he breathed more than another surging light-dancer. He breathed another time, another circumstance, when the scuttling little people had become the preponderant mass of the population, when the sparking manes of power had grown few.

Too few. *And in our sparse numbers, we maintained our rule. The weak, the powerless, still they cringed before our swords of light. But we saw that in too few genera-*

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tions we would be not just extinct but dishonored. We saw that when the last of us died the underpeople would cease to give our ancestors life-of-sight with their breath. Instead they would viciously destroy the flutes that are our immortality. We would perish in our crystalline shells, victims of the genetic whimsy that has rendered our offspring too few to continue our kind.

We would be lost to the universe—the universe that is ours!

But the remaining elite knew they were not alone in that universe. They looked up and they speculated. Somewhere was other life, life similar to their own. For—arrogantly—wasn't the human form the most efficient possible, the most logical? And some day that life, venturing, would inevitably find their planet.

When it did, they would be waiting. Waiting to dance and fly, to flash and spiral. Waiting to relive their entire history, each of them preserved, every line represented, first to last. And there would be nothing to distract the comers from the waiting flutes. Nor would there be mutinous underpeople to destroy those fragile and precious instruments.

There would be no underpeople at all.

Verrons lived the first steps of temple construction. A site far from any population center was selected and the mesa raised. A storage vault to house the entire collection of flutes—the revered ancestors—was constructed, carefully buffered and shielded. On its inner walls the history of the powered race was inscribed, victory by victory, glory by glory. There were no defeats. Nor would there be.

Verrons was spared the final holocaust only by the death of his escort. In the interval between that deathhouse passage into crystal and the reappearance of the fiery wheel of light, Verrons forcibly extracted his consciousness from the vision world. He jerked the flute from his lips, fingers cramping.

They had destroyed the underpeople to insure their own precarious immortality. First they had erected the temple complex—star bait—and then they had systematically blasted and exterminated. Verrons didn't have to see to know. In a reflex gesture, he hurled the flute. *Die!* It clattered against stone floor.

But disgust was not sufficient to route him from the temple while other wheels of light flashed. Nor did destruction of the fiery entity cleanse him of ugliness. And at dawn he tore through the food stores with the others, scattering and wasting. Human and aborigine fed side by side, forked hand and fingered pawing greedily.

VERRONS was half asleep on his cot when Olsen loomed above him, hesitant. "Commander—"

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"You didn't flute." The words were thick.

"No, I—"

"Good. You guard the food. From the abs. Get me if y'have trouble."

"With the aborigines? You want me to—"

"Take m'stunner. Come get me if they go 'way." He lapsed into semi-consciousness.

Sometime later she reappeared. "Commander, the aborigines—I didn't let them at the food stocks. I stunned them. Now they've gone into the jungle."

Verrons sat and peered muzzily at the dial of his chrono. Midday. "Going for trade goods?"

"I don't know. I—do you want me to follow them and find out? By myself?"

Verrons managed to wag an emphatic negative. "Med kit," he demanded gruffly. The inside of his head had congealed.

Ten minutes later, stimulants at work, he stepped from the tent and swayed lightly in the noonday breeze. Olsen led him into the jungle. "They have a quarter-hour start now."

"They travel like turtles." And a little like elephants too. Fortunately his mind cleared and his legs steadied. Verrons found the aborigines' trail quickly, followed it easily, Olsen in his wake.

"Commander—"

"We can't gab and sneak simultaneously."

"Oh." Evidently what she had meant to say was not urgent.

Neither was the aborigines' pace through the jungle. They crossed the stream and led Verrons and Olsen away from the temple complex. Soon the two humans drew near enough to hear the tread of feet. "We'd better stay well behind," Verrons whispered hoarsely.

"Commander, the flute I gave you—"

Verrons' jaw tightened. "I destroyed it." The answering flicker in Olsen's pale eyes told him the impulse had touched her, too. He glanced at his chrono, rubbing his stomach. "We should have packed lunch."

"Because the flutes make us hungry," she hissed.

"They—" Verrons halted. He stared at her, his stomach convulsing in fresh hunger.

"All that light and motion—it's *our* energy that powers it," she said vehemently. "Those crystals draw directly from *us*."

Verrons pulled himself very straight, digesting her words. The stumbling fatigue, the voracious hunger, the dizzy faintness—none were simply the result of late nights and irregular hours. He suffered all the sympatoms of an exhausted power cell. "Olsen, how do you always hit just the right nail?"

"By being fairly bright," she shot back with asperity. "And by knowing when I'm being used."

As he should have known him-

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self. As he would have known, given a few more days, a few more fainting spells. But the aborigines were moving ahead. "We'll talk about this when we get back to camp. At length."

She nodded grim satisfaction. They moved forward.

As they moved into dense vegetation beyond the stream the aborigines' pace quickened. They stopped twice to feed, pulling down branches heavy with yellow berries and gorging. Verrons and Olsen watched from cover of damp foliage, Verrons' stomach clenching enviously. "If we dared touch native vegetation—"

Olsen glanced at him sharply.

"If we dared," he concluded, settling back.

When they continued, he traveled with stunner at hand, seeking bending stalks and swaying shadows alertly. Underfoot the soil was damp and black, rich with decay.

It was late afternoon when the jungle march halted. Ahead, the aborigines' heavy tread was silenced. Verrons and Olsen waited, then moved forward vigilantly.

AHEAD a small dome sat on the jungle floor, partly overgrown with vine. Its door stood open. From its interior Verrons heard the unmistakable grunts of their humanoid guides. And beyond the first dome were others of similar size and construction, lower panels translucent brown, upper panels transparent green.

Cautiously Verrons edged past the first dome and around the first of the second rank. He tapped translucent paneling lightly. It was a plastic material, virtually untouched by deterioration. He pressed his forehead to transparent paneling. Within the dome he could see only dim immobile shapes.

Olsen's features were as bemused as his own. Then, glancing away, she touched Verrons' arm and pointed. Through dense vegetation, he spotted a second cluster of domes. He flared a look back at the structure the aborigines had entered. Quickly he slipped the stunner from Olsen's belt and popped it into her hands. "Keep an eye on them. If they head back toward camp, join me." A motion of his hand indicated the dome cluster ahead. He dodged away.

The second cluster was more extensive than the first and more varied. It included a single longhouse, several small domes and a half-dozen larger ones. Again the exterior paneling, although assaulted by vine, was unmarked by deterioration. Verrons pushed through a hinged door into the longhouse.

The interior held deserted stillness—and chaos. And even by the limited light that filtered through transparent green paneling, Verrons recognized the nature of this particular chaos. Containers large

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and small were littered and strewn, the floor and every surface of the structure were stained and caked with dried smears. Verrons forded the length of the structure, recognizing other things too—tables, chairs, cook units, water tanks—all of alien design, but recognizable in their function, granted a humanoid context. He had found a cookshack—a devastated one.

Devastated like the supply tent he had policed yesterday morning, devastated by a raging localized storm of hunger. Pulling at a cabinet door, he found stacked plastic mess trays. Their fastidious arrangement was ironic counterpoint to the unmannered chaos around him.

Disturbed, he emerged at the far end of the cookshack and entered one of the larger circular domes. Again light was dim but contents were recognizable: cots, tables, chairs, chests, miscellany. But this time everything was in fair order.

He was sifting miscellany when Olsen found him. "They've headed back toward camp."

His head snapped up. "Taking what?"

"Another weather instrument, I think. I examined the structure they emerged from before coming for you. It's evidently a storage shed for weather instruments and meteorological supplies. None of them are exactly like anything I handled when I took Instruments, but they're close enough. And there are logs, too. Not very extensive—lots of empty pages. I couldn't read the script, of course, or the numbering system—"

"Just as I can't read this," Verrons interrupted. The item he thrust at her consisted of long limp plastic pages bound with adhesive. They were covered with an incomprehensible interlacing of line and curve. "As bad as my own handwriting."

Her eyes flickered down the limp page. "Meaning we're dealing with someone who has hands? Like our aborigines?"

He nodded. He indicated the furnishings of the dome. "And someone who has arms and legs and torsos and probably heads—like our aborigines. Or some other humanoid race."

"There were only two humanoid races on this world," she reminded him, "unless you want to sub-classify the underpeople as a separate race."

"But they've been dead for several centuries. Totally dead. And this cluster of domes hasn't been here more than a few years."

"The aborigines then?"

THE suggestion was ludicrous. "I'm not too surprised the survey boys missed this. It's well camoflauged, green and brown sunk in jungle growth. And it's far enough from the temple complex that the area wasn't intensively surveyed be-

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yond overflight with animal-life sensors. After all, the survey crew had less than a month to spend on the entire globe.

"But our light-dancers ruled—and flew—this world for centuries. If the abos were coming up the evolutionary scale anywhere near creating this sophisticated a layout, they would have known about it. Yet we didn't sight the abos through any of the fourteen or so flutes we sampled. The one you and I shared was the most recent and he certainly had no knowledge of a second intelligent race sharing this world."

She nodded thoughtfully. "Then there is one other possibility."

"Right. The race that created this outpost came from offworld, as we did."

"So this has to be just that—an outpost."

"And I suggest we paw around some more before we carry speculation farther."

She agreed. They tackled miscellany together.

Five minutes later they had their key. Verrons spread it on a table and they bent over it together. Heavy silence stretched between them.

"A photo album," Olsen said finally, softly.

"Of the folks back home." The faces that looked up at him from printed plastic pages were familiar: bifurcate nostrils, round oral orifices, fleshy violet veils cascading from the lower lip arcs. The forked hands were familiar too. The physiques might have been, starved of fat and muscle tissue, bared of gowns, robes, trousers and brilliant swathings, the flesh smeared instead with mud. Verrons flicked quickly through the volume. Their 'aborigines' appeared against the technological background of some unidentifiable other world, patron-masters of science and the machine. Even though they could not decipher the script that covered the page backs, Verrons and Olsen read substantially from the photo presentation.

When they had reached the last page, they slapped the album shut and gazed at each other. "They were either surveying this place or actually settling it," Verrons said finally. "A quick look around should tell us. And a bedcount should tell us how many of them there were originally."

Olsen nodded somberly.

The original party had consisted, they soon determined, of better than four dozen members. And they had come equipped to farm. Verrons even located their seed storage. Bags and cartons had been untidily opened and thrown about. "Presumably the seed was never planted," he said, prying a single flat green seed from a crevice in the flooring. "Probably just devoured when the kitchen stocks ran out."

"Surely they brought some surplus food supplies," Olsen said.

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"Enough to carry them a season or two if their first crops didn't do well."

"But flutes make hungry. And that's not all. Flutes make sleepy, dizzy, dull—"

"Dead," Olsen finished tersely. "Especially since they were finally left to live off the land. Which obviously supplies them nothing like a balanced or adequate diet for their species. Do you think—if our supplies will stretch to feed them—they have any chance of recovery? Of actually going ahead with their settlement?"

Verrons shrugged. "Who knows? *If* there's been no substantial brain damage, *if* both sexes are represented, provided that's necessary, *if* we could find a few more stray seed--if, if, if." He glanced up. Dusk eased across the face of the jungle. "Are you game to trek back by moonlight?"

OLSEN was game. Rolling the photo album and tucking it into a pocket, Verrons led way, stunner in hand, eyes watchful.

"The light-dancers used them like disposable power packs. That's how they used their underpeople and that's how they're using us too, Commander," Olsen said grimly. "We'll exhaust our supplies prematurely and we certainly won't do the work we came to do. You can see disorganization creeping in already."

"I can—now. But you and I know something the other members of our party don't."

"Oh? We'll tell them, won't we? When we get back?"

"No, I mean something else. We know a lot about the structure of the underground flute storage chambers. We know, for instance, that the substructure area was carefully engineered so the flutes would not be endangered when the population centers were bombed."

She stared at him blankly.

"That means—conversely—that if we deliver an explosive to the storage area the force of the explosion will be absorbed there without seriously damaging the terrain around camp—or even, probably, the mesa and the temple complex."

Olsen brightened. She flicked back pale hair. "We have explosives, Commander."

"We sure do." He stared down at his hand. Two nights ago it had cradled his golden dancer's accidentally shattered crystal. Last night it had deliberately terminated the fiery dancer's immortality. Now, he vowed, that hand would operate on a grander scale.

When they reached camp, pole lamps glowed spottily, a few lighted, most dark. The supply tent was in a state of devastation. From the mesa flutes sounded, melody of night, drunken, disorganized.

Dying.

"We'll have to wait till light," Verrons reminded Olsen. "Can't

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take the chance of collapsing the grand temple on Heller's head. Think you can slip uphill and snatch a couple of flute cases without disturbing our dreamers? And without falling under the spell yourself?" His mood was suddenly euphoric.

"Why do you keep asking if I can deliver?" she jibed, disappearing into darkness.

Why indeed? By the time he had extracted the explosive from storage, studied the use manual, calculated and measured, she had returned with two empty flute cases. He glanced up sharply, almost expecting to see the dazzle of light reflected in her eyes.

Instead he saw purpose. "What are we going to do about the flutes they have with them, Commander?"

"You're ready to launch a real vendetta, aren't you?"

She bared small white teeth. "I'll settle for total destruction."

He nodded. They had shared more than one tempering experience in the past two days. "You don't think we should leave Heller one or two flutes? For research purposes?"

There was no ambivalence in her expression. "No, I don't. Why should we be any more compassionate than they were?"

But Olsen had never entertained a golden dancer. She had never mated in the clouds, even if only vicariously. Her red dancer had been too busy with weighty affairs to skim the morning sky, to dance the rainbow. He had shown her only the coldly brutal side of his race.

Verrons' golden dancer had shown him more. His hands quivered as he packed the two flute cases and fused the contents. "Now. Think you can sleep?"

She wagged her head emphatically. "No."

He didn't think he could either. But neither of them kept death watch that night. Within the hour both were flung across cots—she brought hers from her tent—asleep.

TENT panels lightened with dawn. Verrons awoke. He sat stiffly and gazed down at his partner in destruction. She was less fearsome in sleep. She looked, in fact, as if she could be disregarded if he changed his mind and returned the explosive to its container, the flute cases to Heller. She looked less compelling than a vision that brandished green light like a sword.

Until she opened her eyes. "They're back." A quick motion brought her to her feet, flute case in hand.

Supply tent revels rang from the opposite end of camp as they slipped into the dawn jungle. Fortunately they met no stragglers. They fleeted dense shadow and mounted the gully.

At the top, when they stepped to

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glistening pink stone, even Olsen softened. "Just in case, I want to have a last look at the grand dome."

"You don't trust our red man to have engineered the substructure adequately?"

She tossed off a wry gesture. "I've been dreaming explosions. So—just in case, I'm going to have a look."

Just in case, he accompanied her.

Their attention was distracted from architecture by the single lax body that sprawled on the stone floor beneath the grand dome. Verrons bent quickly. It was Heller, his flute still clutched tight in protective fingers. Verrons placed ear to chest. "He's alive—just unconscious."

"And they were too brute-dumb-hungry to revive him and get him back to camp," Olsen said indignantly. "Now we'll have to do it. We'll have to drag him down the gully with us after we—"

But her indignation buzzed in Verrons' ears like the diatribe of a bee, furious, futile. His knees buckled and he sat on the cold stone floor, suddenly shaking with hysterical glee. Some mad-dog bomb squad they mad, the grizzled Service veteran and the freckled-faced coed. He laughed gustily, tears coming to his eyes. When he regained control, he demanded hoarsely, "What are we going to use for bodies, killer?"

Olsen didn't see cause for risibility. "Bodies?" Coldly.

"We're going to drop our explosives down the dispensing blocks, aren't we? And make boom?"

"We are."

"Well, it takes six bodies to persuade the stone to open its mouth, Olsen. I count three here, one we'll have to drag, the other two sound enough physically but a little mush-headed. Don't you think?"

Slowly Olsen sat, her mouth sagging. "I forgot. All our plans, so much happening—" She shook her head. But her demoralization was brief. Her slight features cleared and she jumped up again, jabbing a forefinger at the unconscious professor. "He stumbled and broke his ankle, Commander, coming out of the grand temple. We'll need help to get him down the gully to camp."

Verrons' brows flickered up in admiration. "You're right. We'll need at least three strong young bodies. Winchell for starts. The other two I'll leave to your discretion."

SHE was off again. Verrons stood, prying the flute from Heller's clenched fingers. He examined the instrument, then zippered it into a tool pocket. The professor he dragged toward the temple where Olsen had agreed to bring her party.

As they crossed the plaza, early

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sunlight touched Heller's eyes. They opened and stared, unfocused. "Professor? Feel like walking?" Verrons probed gently.

"Ngwf."

By the time they reached the small temple, Heller was able to focus his eyes, somewhat. Life returned to his limbs. They moved, if uncoordinatedly. His response to Verrons' cautiously phrased queries were more forceful. Verrons squatted, forcing himself to watch Heller's weak struggles with a clinical eye. Over a period of two years, three, four at most, the flutes had transformed a party of fifty-two vigorous and enterprising settlers into a clutch of five naked starving brutes. Verrons juggled fancy terminology: tissue starvation, brain damage, terminal malnutrition.

The flutes would wreak the same damage to the human party if unchecked. The light-dancers had destroyed their own mother race and they would destroy any other humanoid race that walked into their glistening trap. Because their own flashy survival was all they had considered of significance. Verrons stroked explosive flute cases.

Then he heard human voices echoing across the stone plaza. When they drew near, he activated the fuse timers and jumped up, both cases in hand.

Olsen led Winchell, Waller and Balsky into the temple. "The professor insisted on coming." She indicated the bag on her back. "And I picked up the rest of the flutes lying around the supply and dining area." Her jaw squared vengefully. "No one thought to ask about stretcher or splints."

That Verrons could believe. It was a rumpled and stuporous crew she had assembled, heads listing, shoulders sagging, eyes vacant.

But this wasn't the occasion for parade call. Their presence had already been noted. From the center of the temple floor the stone block rose, slowly, with inevitable majesty.

With less majesty, Verrons darted forward. A rectangular case appeared from the maw of the mechanism. He jammed it back into the hold and shoved a second case after it.

The end of the block closed. Slowly stone reunited with floor. Olsen's pale eyes flashed wildly. She visibly restrained herself from crowing.

"Come on," Verrons snapped, grabbing at Heller's armpit. "I gave us fifteen minutes to lob in two booms and get down the gully."

They wrestled the lean professor across the plaza to the next temple, their three cohorts zombieing behind, eyes glazed. There, again, stone rose.

"My turn," Olsen insisted.

And a nice job she did, Verrons acknowledged later. A nice job they both did, herding their stupor-

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ous colleagues across the plaza and into the mouth of the gully. Pausing at the edge of stone, Olsen wriggled the bag of flutes off her back. With a gesture exultant, she flung it over the side of the mesa.

By the time they reached the bottom of the gully themselves, Heller was live with protest, all limbs indignant, eyes blazing. "Commander, I can travel under my own power. I'm no invalid. I—"

"Then run!" Verrons seized the professor's arm and propelled him toward the jungle. Glancing back, he saw that Olsen urged the other three into motion.

A sharp crump halted the entire party. Briefly frozen, all stared back at the mesa. A second crump moved its rocky sides and lifted the hat briefly off the single temple visible above. Slowly stone settled back into place. The temple quivered but held.

Heller's lean throat writhed and gave birth. "Commander, what—"

"We've killed the flutes!" Olsen said.

No one believed her. All eyes swung to Verrons for contradiction. Even Winchell, Waller and Balsky achieved fleeting alertness.

Verrons nodded. "We slung explosive into the flute crypts. The rest of the temple complex should be intact—more or less—for future researchers. You can draw historical data from the interior wall of the crypts—they're inscribed with a detailed history of the race—if you can piece them back together and decipher them. You might even pin down the technology there—to whatever extent it ever existed. But you can forget the flutes."

Heller gobbled. "You've casually, unilaterally, shattered the instruments of the evolutionary plan? You've—"

"The plan is survival, Heller. Nothing esoteric about that. It's the same on every world. Who can survive does. Who can't—doesn't."

Heller didn't see it that way. Frothing, gesticulating, he launched verbal attack. "You cannot subvert the plan and live, Verrons. The plan has existed since time began. Not just Earth time—total time, consciousness time. The plan—"

"Then look at it this way, Heller. If there is a plan I'm a part of it, too. And I've just fulfilled my function." Turning, Verrons waded away through jungle growth, abandoning them. He had only done what he had to.

He had, in fact, done what he had to in more ways than one. His step quickened as he touched Heller's flute, still zippered securely into his pocket. He felt confident it was alive. When he reached camp, he would hide it in his case and no one would know it had survived. But one night soon Verrons would make his way from camp to some deserted spot far away and he would soar the clouds again. Patting the metal barrel, he sprinted toward camp. ★

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GALAXY BOOKSHELF

Theodore Sturgeon

LAST month I reported to you how I toted myself bowlegged with a suitcase half-full of books and galleys and what is amusingly called a "portable" typewriter, writing when and where I could. I spent four days at Penn State, at the Fourth Annual Conference of the Science Fiction Research Association (where Jack Williamson took the "Pilgrim" Award, and Dr. Thomas Clareson was re-elected to the presidency) and then was whisked—and I mean whisked—to Cornell, where with barely time to throw on another jacket I went to cocktails and dinner and the auditorium, where I was introduced by Dr. Carl Sagan. Afterward I met with the Sigma Phi fraternity brothers who were my first and most cordial hosts—and then moved for a couple of days with the Sagans. There was a guided tour through the space-and-time-wide environs of Sagan's part of the Astronomy Department. Imagine if you will a single corridor in which, side by side, are 1) a laboratory containing thousands of feet of glass plumbing in which methane, ammonia, sulfur and water are being hammered by a variety of energies, producing organic substances—amino acids and the like—and 2) right next door, a room full of computers in which mathematicians of the highest level are tearing away at the problem of black holes. Just a few steps from one another!

Then there were encounters with the science fiction people—as I understand it, lacking an official

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sponsor for a course, some thirty students are teaching themselves! I found them sharp-minded, informed and responsive. Thence to a command appearance before some of the English Department, who (it seemed to me) had a little difficulty in acknowledging that myself and my (our) work is not totally dedicated to gears, BEMs and bad writing. On to New York and then, at the weekend, to Boston and Marvin Minsky, head of the Artificial Intelligence Lab at M.I.T., where, with eighty people in his staff, he is attacking the problem of a machine that can think. I went through his laboratory, a wonderland of computers, two-elbowed articulated "waldo" arms and, by the dozens, fine-honed, wide-ranging, utterly fearless Brains. That collection of people has to be one of the most remarkable assemblages on the planet.

I had the pleasure of carrying a message from Sagan to Minsky. "Say we have this Mars lander," said Sagan, "and it tells us, 'I have begun the descent of a thirty-degree slope. The visibility is near zero. What shall I do?' and you send to it: 'Stop already, idiot, there could be a 500-foot cliff ahead.' But—it takes twenty minutes for us to get the message from Mars and twenty more for our word to get back to the lander.

"So tell Minsky: *'Hurry up!'*"

After an unforgettable weekend in the Minsky manse, a great rambling old house with a computer terminal (which proved to me that though many psychoanalysts may indeed have brains, they don't need them—ask a computerman some time to demonstrate to you the program called DOCTOR), an artificial nightingale, a trapeze, a great little kid with a broken leg who was run over by a bicycle, his twin sister who says, "Daddy: Two." "Seven," he answers. "Three," she says. He ponders and then says "One . . ." They're playing tic-tac-toe in their heads. And another daughter who was teaching math last year when she was fifteen—and who has a boa constrictor and a wonderful mother who knows more about children and public health than any three towns' Town Boards. (Speaking of wonderful women: I forgot to mention that the art on the famous gold-iridium plate now being transported into deep space by Pioneer 10, to inform some intelligence, somewhere, some time—perhaps a billion years from now—as to who we are, where the ship came from; this art was done by the beauteous Linda Sagan, who never gets credit.) After the weekend, another speech and then a meeting with the M.I.T. S.F. Society, which owns the most extraordinary, the most complete and the most beautifully organized science fiction library I have ever seen.

These are only a very few of the encounters I had on this journey and I wish I could share every mo-

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ment of every one of them with you. But this is a book review, so:

Those Who Can, A Science Fiction Reader, edited by Robin Scott Wilson (Mentor, 333 pp, with biographical notes, $1.50) is the way the title goes on the title page. On the cover, *Those Who Can* is set in eight-point Myopia, while the subtitle is in second-coming capitals, which is an indication of the ways in which publishers' sales departments think. Anyway, the book is a refutation of Shaw's: "Those who can, do. Those who cannot, teach—" and is brilliant. It's an anthology of fine science fiction yarns by some of the very best in the business; it's a book of essays on writing by writers who know what they are doing; it's a book of criticism and lucid example, articulate and entertaining. It's set up this way: Wilson, founder of the Clarion courses in science fiction writing, chose a dozen writers and asked them to comment on their own work, two each within the following six arbitrary sections (". . . it is probably the worst possible way to go about it," writes Wilson in his intro, "except for any other way I can think of."): plot, character, theme, setting, point of view and style. A few words from the editor at the head of each section are followed by two stories, each coupled with an essay by the author about the story—under 'setting', for example, Joanna Russ's fine *The Man Who Could Not See Devils*—then her remarks on 'setting' as it applies to the yarn. And then Silverberg's *Sundance* and his reasons for setting it the way he did. Under style Fred Pohl gives us not one, but two of his most brilliant shorts, *Grandy Devil* and *Day Million,* with a fine exposition of 'style' as it applies to both. Damon Knight has done something unusual and fascinating under 'theme' in having his story *Masks* run on the right-hand pages, with his running commentary and notes on the left—something I could take willingly by the bookful. The authors, besides those mentioned, are Williamson, Delany, Keyes, Ellison, Le Guin, Wilhelm, Wilson himself, and Gunn. Now, I learned at the SFRA Conference that there are scheduled, for 1974, about five hundred courses in science fiction in high schools and colleges—and I would most urgently recommend that every teacher and every student of every one of them get this book early and bone up on it. I should like to stress the fact that, rich as it is, the book isn't a compendium of hard definitions and final answers. Far from it. It deals with a living, growing, changing thing—writing—and it deals with its parts in the voices of highly, and rightly, opinionated people, with many of whom I disagree. And so will you, I think. I wish Wilson would do another like this, with a dozen more writers. I wish someone

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would set up a seminar based on this book. What I'm trying to say is that I am impressed and enlivened by this package.

The Best of Fantasy and Science Fiction, 24th Series, edited by Ed Ferman (Doubleday, $5.95), with six gruesome delights by cartoonist Gahan Wilson, is a Best Buy, with such top-of-the-mark classics-to-be as Pohl's *Shaffery Among the Immortals* and Ellison's *Deathbird*, Poul Anderson's shattering *The Problem of Pain* and Phyllis MacLennan's almost equally poignant *Thus Love Betrays Us.* We can rejoice at the reappearance of Alfred Bester, with his enchanting *The Animal Fair.* This extraordinary talent has been too long away from our scene. Raylyn Moore has an unforgettable story about a frighteningly talented little boy and a starchy schoolteacher. But the one that will roll you around on the carpet is called *Sooner or Later or Never Never* by Gary Jennings. Clearly his own kind of writer, Jennings is the wildest thing to come along since R. A. Lafferty.

EXCEPT, of course, for Geo. Alec Effinger, who is out of his mind in a totally unique fashion. *Relatives* (Harper and Row, $6.95) is one of those rare books with which you participate or you don't—and if you don't it's a dead loss. Effinger deals here with realities—note the plural—either in an effort to circumscribe and therefore describe reality itself ("our" reality or "the" reality) or to prove fairly conclusively that reality is so fluid, composed of so many variables, that perhaps the only wise course is to take anything real with a dose of salts. If the book grabs you, it will grab you hard—but it's not for everybody.

I CAN say the same about a completely different kind of book, and a different kind of grab: Harry Harrison's *Star Smashers of the Galaxy Rangers* (G. P. Putnam's Sons, $5.95.) Harrison had a ball with this one, a Tom Swiftian, gee-whiz parody of the very worst that our severest and most ignorant critics lay on us, salted with puns, plays-on-words and double meanings for the delectation of a fairly wide spectrum of "in" people. Personally I love this kind of thing at short-short length. If you like it in large doses, here's 180 tightly packed pages of it, so have fun.

WILLIAM JON WATKINS has written a novel, *Clickwhistle* (Doubleday, $4.95), which deals with dolphins in a way that pleases me. As I have so often mentioned before, one of the most potent challenges ever given a writer was John Campbell's: "Give me a story about a creature that thinks as well as a man but not like a man." Watkins has done this very well indeed. His

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dolphins actually think a hell of a lot better, and the interaction between the protagonist, Dr. Pearson, and the various cetaceans, especially the one called Clickwhistle, is most interesting. Grafted on to this innately fascinating encounter are matters more cosmic, I think, than they need be, and added to the fact that Watkins' prose tends to be dense and unleavened from time to time, the book is a little uphill to read. I hope to see more of this writer.

Next month, perhaps a little late, I'll get into a real find, a book called *Joshua, Son of None,* by Nancy Freedman. And then a takeout on a new small explosion in a very important area: science fiction children's books.

AND quite by the way: something I learned on my recent travels. If you begin to hear of an upsurge of UFO reports, it is not because the phenomena have suddenly increased. It's because the computers which analyze sky sightings generally have until very recently been programed to disregard and not report anything that is not in orbit or on a ballistic course—matters they can ascertain in hundredths of a second. The very thing that makes the UFOs so perplexing—that they follow neither orbital nor ballistic tracks—has disqualified them from notice! But you'll begin to hear about them more, because of a development called MERV. I think I'd rather be alive now than in any period in human history.

★ ★ ★ GALAXY STARS ★ ★ ★

Christopher Priest's massive new novel, *Inverted World*, dealing with an Earth whose economy has collapsed totally and globally due to an energy crisis, was not intended to be timely when written. And the beginning of its serialization in the December issue of *Galaxy,* which brought it to the newsstands almost simultaneously with President Nixon's announcement of the current power crisis, was pure coincidence. The book was intended to be science fiction and that's what it is. For your editor Chris Priest's hyperbolic world also has overtones of reminiscence—it recalls hauntingly college days and a professor's joyous explanation of the Einstein Theory in terms of a beer bottle shape—unless, of course, you prefer champagne.

Chris Priest's himself, however, is as timely as tomorrow. He is still in his twenties. His first book, *Indoctrinaire*, was hailed by the London *Times*—his second, *Darkening Island,* recently placed third in the John W. Campbell Awards. *Inverted World* is his third. His British publishers are Faber & Faber and his American publishers are Harper & Row.

He has been married but is not now, loves Paris and hopes to live there some day—hopes also to visit the United States, which has great fascination for him. (He stayed up recently until 2:30 ayem to catch President Nixon on television, but fell asleep halfway through the broadcast for some reason. Energy crisis?)

He likes his privacy, dislikes discussing himself, but it is a well-known fact that he lives in a private house in Harrow, an area haunted by the ghosts (among others) of Byron and Churchill.

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RIVERS OF DAMASCUS

R. A. LAFFERTY

I

THE caravan clowns came to town about four times a year, usually in the service of a caravan, sometimes not. They came now to the town (the oldest in the world) out of service and with no clear purpose. They were strictly on a bold-bashful skylark. There were a few less than a hundred of them. They were slight, smiling, shy, desert Arabs. The guards of the city, though they usually treated the clowns with a lowering sort of theatrical harshness, really liked them—but especially they liked to devil them.

The desert gamins, first leaving long and rickety constructs of some sort at a little distance on the sand, came into the city by the east gate, whence the street named Straight (the Latins called it Via Recta and

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the Arabs Souk-el-Taouil) runs west to the heart of the city. They came in one by one sideways as though it were a narrow way, though the gate was high, wide and completely open. This was in the month of March of the Year of Restored Salvation 635.

"Thieves, coney-eaters, camel-suckers, trench-straddlers, good-for-nothings—what do you want in our town?" several of the tall town guards demanded and they clapped the slight desert youths roughly on the shoulders. The shortest of the guards was a head and a hand taller than the tallest of the Arabs.

"Bread—we want bread," one of the Arabs, less bashful than the others, announced. The desert Arabs did not have bread of their own. They ate camel cheese and small animals that they killed in the sand and rocks. They ate wild figs or cultivated apricots and pomegranates and almonds when they could steal them. But bread they ate only when kind persons gave it to them. And now several of the kind, though thunderously threatening guards bought hot bread from a bread booth and gave it to the Arabs. They ate it rapidly, almost furtively, but with real pleasure. All of them except one.

"I will not eat your bread," said Khalid ibn-al-Walid. "It isn't right that I should eat your bread and then come back and cut the throats of all of you who will not kneel and beg for mercy."

"Ah, squalid Khalid Walid, will you cut our throats?" one of the big town guards asked.

"Aye," Khalid said nervously and looked around to be sure that his own jinni or angel did not hear him say such a thing. "I must cut the throats of all of you who will not submit. I will not like it any more than you will, but it is one of the things that I must do."

"With that little sword you will cut our throats?" the guard asked. "Let me see that wonderful little throat-cutter you have there."

Khalid handed his sword up to the high hand of the tall guard. The guard snapped it in two in his fingers and gave the pieces back to the slight Arab. Khalid's face broke and he began to cry.

The other Arabs ate the wonderful bread that was given to them. They ate apricots and roasted meat. They talked with the town people and the town guards, for the chattering Arabs (after they had passed the moments of their shyness) were always full of news. They were called the desert scrolls. They drank the bright wine that the people gave them. All the Arabs did these things except Khalid, who refused to eat or drink, though he had always loved the wine of this place. Then it was time for the Arabs to go and they knotted about the east gate. Khalid still snuffled over the loss of his sword.

Several of the guards held quiet conference. Then one of the guards,

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the one who had broken the sword in his fingers, went and brought back a real Damascus sword out of his generosity (for this was Damascus, the oldest town in the world and the Arabs called it Dimisk es-Sham). The man gave the wonderful sword to Khalid (it was not ornate, but it was of the good steel and manufactory) and that Arab brightened up like the sun coming out from behind the mountain clouds of the Anti-Lebanon. Then all the Arabs went out by the east gate.

"That can not really be Khalid ibn-al-Walid the Great?" was the unbelieving protest of John Dragon who was dean of soft sciences at Southwestern Polytech. "It just isn't possible."

"It does strain credulity," Joseph Waterwitch told him, "but that's the way it comes through and that's the way it's projected. I must suppose it's all valid. It couldn't be otherwise."

John Dragon, Joseph Waterwitch, Cris Benedetti, and Abel Landgood were on expedition to observe certain events here by para-archeological probe.

THE Arabs shuffled along outside, beneath the basket wall. Khalid was grinning into his scanty beard. He usually pulled this little sword act and trick several times a year and he had now quite a collection of good Damascus swords. The Arab party, a little fewer than a hundred young men, shuffled carelessly back toward their desert.

For about a furlong.

Then they gave a great whoop. A dozen small horses seemed to spring out of the sand and were quickly mounted by the dozen or so of the Arabs so fortunate as to own riding animals. These dozen had also drawn bows from somewhere. And the others had swords suddenly. None of them except Khalid had had a sword earlier. Some of them picked up two rough ladders they had left on the sand before their first entrance to the city. They ran with these ladders toward the basket wall of Damascus.

"See if you can get better detail on the swords," John Dragon asked Joe Waterwitch. "Hitti, who is never wrong, has written that the Arabs carried long, straight swords in scabbards flung over the right shoulder. And Belloc, who also is never wrong, has written that they carried short curved scimitars on their thighs."

Joe Waterwitch emphasized the swords and the observers all watched as the steel showed a little more clearly.

"They are every sort of

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sword and knife," Water-witch said then and they all saw that it was so, "and they are carried every which way. There is no standardizing them and there is no seeing them any more clearly than this."

The Arabs placed their two ladders against the basket wall (this section of the wall was so called because it was there that St. Paul had been let down in a basket). The ladders reached only about a third of the way to the top of the wall. Nevertheless, the Arabs crowded the ladders from top to bottom, resolutely climbing up and up and those on the top waved their arms as if to try to fly upward.

"What are you trying to do, little sandmice?" the guards asked from the top of the walls. "You'll hurt yourselves. Those little ladders are about to break."

"We are going to scale the walls," Khalid the leader of the Arab sandmice called up boldly. "We are going to storm the town and slaughter the inhabitants and establish ourselves in this stronghold. And from here, we will conquer the whole world."

"If you want in come in by the gates which are always open," the guards called down. "We think you are the same bunch that was in just a little while ago. Then you went out again. Those little ladders will not reach. Shall we put down longer ladders for you? Shall we let down ropes? Are you under some vow to scale walls?"

"Yes, we are under vow to scale walls or to batter them down," Khalid cried. "We will not come in by the gate until we have received your total surrender. Defend yourselves! It is not to our glory if we conquer only cowards who fear to fight."

Khalid and some others began to shoot arrows up at the guards. They hadn't true arrows, only crooked and badly fletched shafts. They hadn't strong bows—the arrows did not even reach the top of the walls in their flight. The only damage done by the arrows was to one of the Arabs. This man had

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shot his bolt straight up into the air. He stood and gazed at his arrow as it spent itself, then tumbled over and fell back toward him. The arrow pierced his eye. Some of the guards gasped with shock, but several of them laughed.

"If you laugh at him, if you laugh at us, then you laugh at God," Khalid called up angrily.

"We do not mean to laugh at God," others of the guard spoke down. "We are honestly grieved that the man injured himself."

Both of the ladders broke with weak cracking noises and tumbled the Arabs onto the sand and rocks below. One man was killed and several were lamed. The Arabs shuffled off toward the desert and those few who had horses turned toward the barren and sunburned hills.

"We do not retreat," Khalid called from the back of his own horse. "It only seems that we retreat. We have breached your walls and several, including myself, have entered. This night I will sit on the highest seat in your council room and will hold command of the city."

"You may come to the council room," one of the guards called, "and you may talk to the commandant of the city. He may be able to understand what it is you want. He is a man of great understanding. But you may not sit on the highest seat."

"Yes, I will sit on the highest seat tonight," Khalid insisted. "I am already inside the town and the room, though you know it not. I will command—I will order—I will rule and I will slaughter. And after I have slaughtered sufficiently I also will become a man of great understanding."

Khalid followed his men back into the hilly desert. They left a plume of dust behind them and when the plume dispersed, they were gone. There had been somewhat less than a hundred of these slight Arabs. And there were something more than ten thousand of the burly empire soldiers and guards garrisoned in the city.

"That cannot be the Moslem conquest of Damascus of the year 635," John Dragon, the dean of soft sciences, was protesting in near panic.

"Yes, that was it," Joe Waterwitch insisted sadly. "We have tuned it in pretty clearly—we have watched it to its end. That is what happened and that is all that happened."

"There was supposed to be a six-month siege," Abel Landgood commented. "And when that six months was over Damascus was under Moslem control."

"We will look for the siege, but we will not find it," Waterwitch said. "There wasn't any siege of that sort.

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What we have just seen is all that happened. And as for Damascus turning from Christian to Moslem—well, I don't understand it either. A plum will be green and then it will be red (if it is a Damask plum it will be). There are no reasons at all for many of the changes in history. Let's leave it at that. I do not know why history, feeling guilty perhaps, is sometimes impelled to supply false reasons. Better no reasons than false—and there are no reasons for the results from Damascus."

"I believe that there *is* one more event, Joseph," Cris Benedetti said softly. "Our focus seemed to be on three hours before sunset. Let's allow two more hours for ablutions and the supper meal. So, let's see what we can pick up in the council room five hours after our last focus."

Cris Benedetti was the revered professor of humanities and histories and literatures and esoterica at Southwestern Polytech. He possibly had more prestige even than had John Dragon, the dean of soft sciences. He certainly had more than had Joseph Waterwitch—Joe had a peculiar lack of prestige. But Joe believed in himself and his methods and he didn't like to be told that he might have missed something. He looked at Benedetti for a long minute.

"All right, we'll do it," Joe Waterwitch said then.

THE find-and-focus itself took nearly five hours, but the times were not connected and the delay in search did not matter. Then those of the expedition were able to see what was going on at the evening's session in the council room. And what was going on was a developing ruckus.

There were seven great men sitting in the high seats in the council room: pompous men, somewhat amused now and a little bit fearful. They were amused by an audacious and slight man who was leaping about in the rafters over their heads—he mocked them, harangued them, and they smiled. But they were really slightly alarmed by the monkeylike climbing of this man, actually fearful of his stark animality and his go-devil grinning and of the jinni-like secrets that were tumbling out of him in unbottled speech that sounded as if it would never be exhausted. They were disturbed by the gaminlike thievery of that rafter rooster who'd as soon steal a world as a sack of walnuts.

"I will command—I will rule—I will slaughter," the monkeylike man in the rafters was heckling, "and when I have slaughtered enough I will become a man of even greater understanding than your-

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selves." This heckling climber over their heads was Khalid.

"I wonder when the Byzantine look made its first appearance?" John Dragon asked his fellow observers.

"Surely not in Byzantium," Cris Benedetti said, "but here in Damascus, in this place, on this night. Look at those seven on their high seats! It has just dawned in their minds that they have lost it all (that is the underlay of the Byzantine look) and that if they continue as they have been nobody but themselves will guess that they have really lost (that is the brocade surface of the Byzantine look). I don't know how they have lost and they don't—but the towering irony comes only after they have lost completely and disregarded that loss."

There were seven men there with that look on them. In the highest seat was the commandant of the city. At his right was the bishop. At his left was the treasurer. The commandant himself was pomposity justified. He was wealth and line and power and intelligence. He was the deep texture of past pleasures, the hot light of present pleasure and the aromatic glow of pleasure still to come. He laughed at his own defeat and forbade it to speak.

The bishop on the right had exceptional ability, a highly refined and rarefied sensuality, a canniness that had obtained an unusually good bargain from God himself, a stormy sort of sublimation (channeled and diverted thunder), compassion, wit, well-being—and there was a foxy slyness that went with it all. This bishop had fished in stranger waters than his father Peter ever knew—in Third Ocean of whose very existence both God and the devil are ignorant.

And the treasurer on the left had the endless geniality that comes from never exhausted stores. He had the money bags that pour out specie forever to smooth the paths and to make friends—the bags remain full no matter how much is taken from them. He had the sack of inexhaustible pleasure, and the barrelful of those sweet serpents named intrigue whose joy outlasts that of every other game. And into the eyes of this extraordinary treasurer had come a new glow now: happy treason, the last pleasure of the almost jaded.

Two other men sat on the right, two other men sat on the left—they were high and intricate men—of the sort who maintained the heavenly Byzantine Empire on Earth.

"I sit in the highest seat in the council room," jibed Khalid, who had made himself a seat up in the rafters (that Khalid was an ungiant jinni who had escaped from some bottle), "and I will hold command of the city."

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One of the great men on the left of the commandant laughed—Khalid had nearly fallen from his high place when he had gestured too violently. "It seems a very precarious command."

"I want it to be precarious," Khalid howled. "I am already inside you, though you cannot suspect it yet. I will command—I will order—I will slaughter. I will breach your walls. I lay siege to you now."

"How long is the siege that you lay for us?" asked one of the great men on the right and he grinned in his beard.

"A half-year siege," Khalid called down and he danced on the smoke-blackened rafter. Guards were climbing after Khalid, but they could not scamper about with his quickness or his wittiness—they couldn't catch him. Khalid bounded to other rafters and cross-members.

"Your eyes are put in your heads wrong and they look out wrong," Khalid taunted. "Your eyes look for me where I am no longer to be found. You'd double your defenses to keep me out, would you, city fathers? But I am not out. I am the mind-worm working inside and I besiege you from inside. I came in under the walls and under your minds by the other river, the one that is not to be found in your country or in the maps of it. You great men cannot understand this."

"I understand it," said the great treasurer and his eyes were a-dance with happy treason.

"I almost understand it," said the great bishop and his fingers were avid to be dealing with strange fish.

"And I almost understand it," said Cris Benedetti, one of the men working on the para-archeological probe.

II

There is an absolute mystery covering all early Islamic expansion and military conquest. There is no possible way these things could have happened. Circumstances sometimes put forward to explain these happenings are in fact later circumstances created by these same happenings. The clear truth is that the desert Arabs were absolutely inferior to all their neighbors in wealth, numbers, technology, health, ability, intellect, location, ambition, sophistication, weaponry, organization, transportation and experience in warfare. Their victories could not have been won in reality. It had to be a subjective religious rapture to make it seem to the Arabs that they were conquering. But how was the exterior world and its peoples

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conned into authenticating these subjective experiences of the miserable Arabs? Moreover, Islam was not then a rapture religion—it did not become so until two centuries later. Nor was Islam then a militant religion—it became so only *after the completion* of those astonishing, early, world-shaking conquests.

At Damascus, the attacking Arabs had only one-hundredth the numbers of the defenders. They had nothing but short, curved knives and inferior bows with which to assault the walls. They had no battering rams or siege engines at all—they did not even have entrenching tools. How did they breach the walls after a six-month siege? How did they take the strong town that had one hundred defenders against every one attacker?

Here was an incredibly small and disorganized band of half-starved, half-demented desert men looking out of pus-caked eyes (Paul was not the first nor the millionth man to go blind on the dazzling road to Damascus), small men, sick men, nearly blind men, men with no ambition and no hope, beggars wrapped in euphoric dreams more ragged than their clothing, men sleeping away most of the hours to forget that they had nothing to eat. How did these men, at the very first step, conquer Damascus? How did they, at the incredibly swift second step, conquer the world?

Could one travel in a time wagon pulled by time oxen back to Damascus in the year 635 and look at the events with informed, modern eyes, it is possible that a missing piece to this puzzle might be found. But I doubt even this. There is no way that those events could have happened!

The Back Door of History,
Arpad Arutinov.

"Gentlemen, we have missed it, we have missed it completely! We are stumblebums. That is what the respected scientists have been saying about us all along and this seems to be the fact of the matter. But there cannot be anything wrong with our methods. There cannot be that much wrong with ourselves. There has to be something wrong with history. History was not there when we went back to examine her."

John Dragon

"So much of this has depended on me and I do not feel that I have failed in any way. I have been the instru-

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ment and the receiver and I believe that I have received correctly what was there. The fact that what was there is impossible is beside the point—overwhelmingly beside the point, I'm afraid. I've been the dowser and the medium, but I certainly am not a happy medium over this. Where have we failed? Or rather, what is it that has failed us?"

Joseph Waterwitch

"This brings into question the whole subject of reality. Reality has been an assumption, a postulate, an evident basis and beginning. It now seems to have been a false assumption. Reality has disappeared on us when we had the temerity to examine it too closely. What we now need to find and to use is a workable alternate to reality."

Abel Landgood

"Gentlemen, I believe that our difficulty is that we have been using highly polarized information."

Cris Benedetti

From the *Landwitch Papers*
(the minutes of the first
para-archeological probe)

The Rivers of Damascus as mentioned in Scripture are two: the Abana River and the Pharpar River. But where are they now? The Abana River is now named the Barada. This is the only River of Damascus to be found in the physical world. There is no other river in that part of the country. There is no dry bed where any other river could ever have run. There is no choked and silted valley that could have been a riverbed in some other age. The Pharpar River is not to be found anywhere in that scorched land at all. There is no trace or remnant or body print of it to be discovered anywhere on Earth.

Well then, have you looked *under* the Earth? Have you looked *inside* the Earth? Have you looked inside the creatures of the Earth? When a river is lost we must leave no land or mind unturned until we have found it, for a lost river may be anywhere. I believe that the Pharpar River has always been of the internal sort. It is the secret river that not only greens the soul but also runs under walls and gains entrance to all fortified and walled places of the world and of the mind.

Regard your own estate and case. Is your own town not built on two rivers which are separated by a firmament between? One of them is the

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impossible river by which all things may enter anywhere. We'd be robbed of our celestial birthright without it.

The River Inside,
Ignace Wolff

THE heterodyning of a brain wave produces a *difference frequency* or beat in conjunction with the normal brain wave—and this difference frequency can be both a sending and an echoing beat. It may also become a receptor beat, and in some cases a reverberatory beat of very long duration. Of how long duration? Oh, two thousand years or so before it becomes too greatly diminished to pick up.

But scientifically a beat may reverberate for only microseconds after the inaction of its source—this scientific objection may not be assailed in its own field and context. But may the scientific objection be heterodyned out of its own field? May it be superheterodyned to a place where it accepts what it had seemed to deny?

The ever-changing modified or heterodyned wave pattern is a searching or tuning pattern. It seeks whatever is in resonance with its voice. It changes its voice till it finds that resonance. But hardly one person in a thousand can consciously heterodyne his own brain wave patterns to obtain the variations and the beats. The rare ones who can are sometimes called dowsers. True dowsers can get echoes from almost all physical substances—and also from many electrical coronas that are not really physical substances. Very good dowsers can get resonance and echoes from an even more rare sort of corona, which is called patina. The patina, that aged and weathered surface, is generally thought to be a physical effect and substance—but it hasn't a physical origin.

Adept dowsers may also get resonances from ancient reverberations (some of them associated with patinas or other coronas, some apparently associated with nothing but themselves) that may have become endemic to a location, to have lodged there securely and enduringly. And dowsers are peculiarly able to get echoes from underground streams, which may be heterodynings of surface streams which are not necessarily in the immediate location.

A good dowser can hear the signaling of rocks and sands and loams. He can hear water talk. He can hear air talk. He can hear a valley or a fortress talk. Joseph Waterwitch was a good dowser. He came by his talent honestly. He was a Shawnee Indian and the Shawnees can outdowse any other Indians in the world. Waterwitch had been given to Joe's folks as a family name because of their expertness in witching anything from water to fresh meat trails.

But dowsers are scientifically un-

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acceptable. Joseph Waterwitch had been kicked out of the usually free and easy Geologists' Club when he refused to deny that he had dowsing talents. He had been kicked out quite literally—out of the private bar, out through the dining room and the meeting room, out through the library and exhibit rooms. Then he was kicked violently down that short flight of five steps to the street—to the injury of both his pride and his coccyx.

But are all scientists absolutely closed to such things? May not some entry be made into some minds? At times it has been thought that an entrance can be made by certain underchannels, by streams that flow unsuspected below the medulla walls or that permeate the *pons variolii* to break through. (Even at the Geologists' Club there had been one man drenched by the under-river, a man who might open the gates at the proper time—when he heard the off-key whistle of sweet treason. This man knew a lot about odd frequencies and could split stubborn rocks with his own double-tuned whistling.)

A PATINA is a reverberating surface that is composed entirely of its own history and possibly does not exist in the present time. But this definition beggars John Dragon's statement that there is no room for the present in present time—that the present must always be phenomenologically slightly in the future and cannot be perceived except by this very slight shift into future time. Present time is an anomaly—it is less than a quantum wide and its very narrowness posits its nonexistence. It is too narrow a crack to exist—and yet there may be a two-way traffic through that narrow crack. Unacceptable things do come through the narrow crack that is mistakenly called the present, such as cranks, ghosts and treasures.

A patina may be very deep and still retain all the characteristics of a surface phenomenon. It is made up of old vibrations and waves and of nothing else—yet it has mass and physical substance and waves supposedly do not. And a patina, though seldom containing metal, shows magnetic properties.

It is not only stones and rocks that acquire a patina. The patina is often spoken of as an aging and a weathering, but young and growing things sometimes show striking patinas. An adolescent plum just coming to full color may have a patina—a smoky surface ghost of that full color: it is patina, whatever other name it bears. A human being may have a patina which contains all of that being's experience. And a newborn child may have a surface patina that reflects the complete history of its ancestors as well as its own makeup and shorter history. In countries where the niceties prevail this valuable patina

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is often washed off the newborn child. Such removal makes for trauma and dislocation. The child is permanently deprived. He will grow other patina but it will never be the same. He will forever lack roots and history and surety. He will seldom become a truly reverberating person.

Patina is the depositing and burial of objects and events and persons. And patina can be, under the proper tutelage, the resurrection of those objects and events and persons. Patina is the recording and remembering and transmitting surface of everything.

But is there any proof at all that patina may record and remember and later transmit or recreate persons and objects and events? Surely there is proof. Ghosts are the proof—the tens of thousands of reports of ghost persons and ghost events. Ghosts are the transmitting and recreating of old things and old doings.

You do not accept ghosts? You have not been touched even once by the ghost river named Pharpar? It is not good to remain untouched by it. It is the river of resurrection. If you will not accept ghosts, neither will you accept one risen from the dead.

THE dowser turned inside out is the eidolon man. Joseph Waterwitch was a supreme dowser. His associate Abel Landgood was a dowser-inside-out, an image man or an eidolon man. As a projector of valid eidolons, images and recreations he was as expert as a formally untrained person can be.

The great breakthrough arrived with the acquaintance and association of Waterwitch and Landgood. Together they drew up the Landgood Covenant. They had the whole procedure completed between them before they went to have it instrumented.

Abel Landgood had had a most normal childhood, even excessively normal. He had walked and talked with ghosts from the day he was able to walk and talk. All children do this, but not all are as good at fixing ghosts as was Abel. Abel was an imaginative, creative boy. He was weirdly happy in his relations with the world and that is always important. And he did not like empty spaces at all. Whenever he found a stubbornly empty space he filled it with his imagination. There had been an empty space between the alley fence and the alley behind his house. He filled it with three apple trees and some blackberry bushes and would eat apples and blackberries there till he got sick.

There was also a little vacant half-lot across the alley. A house had once stood there. It had burned down. Abel put another house there—a funny-looking house. He put a very fat woman and a very thin man to live in the house and fixed their names to be Mrs. and Mr. Ostergoster. He put

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a boy to live in the house and fixed his name to be Mikey Ostergoster. Mikey fixed a cat. Abel fixed a dog that chased the cat away. Mikey fixed a crazy man to chase the dog with a stick. Abel fixed a soldier to chase off the crazy man. Mrs. and Mr. Ostergoster came out and quarreled with the soldier. Everybody began to fight then. Abel's father came out and unhinged all those folks and the funny-looking house also. And those things were gone in a blinking.

"You shouldn't have brought back the Ostergosters," Abel's father told him when they were alone and the echoes of the disturbance were retreating into a secondary patina. "There are people in the neighborhood who still remember them and remember how they burned in the little house there—ah—in the little house that is not there. And you shouldn't have brought back the Confederate soldier to chase off that crazy man. With our reputation we can't afford to seem too old-line Southern. And you shouldn't have brought back that particular dog. I remember that dog before they had to kill it. It was one mean dog—it's a wonder you weren't bitten. Cool it a little bit, Abel, or people will think that you're an odd kid."

But Abel wasn't an odd kid at all. He was absolutely normal. It's the kids who lack or lose the basic talents who are odd.

The Landgoods had to move twice during the childhood and adolescence of Abel. The family seemed to attract ghosts and the neighbors objected. (Ghosts are normal, but people often react abnormally to ghosts.) It was not all Abel's doings about the ghosts. Like Joseph Waterwitch, Abel Landgood did not acquire all his talent in his own generation. Both his father and his mother had talent.

And, like his parents, Abel retained his talents after he had become an adult. An average child will lose such abilities, but a normal child will retain them.

JOSEPH WATERWITCH (the man with the locating or homing beats, who could bring any interesting location or time or patina into focus and privately enjoy it) met Abel Landgood (the man with the strong imagination, the image-projecting or eidolon-making talent by which interesting old things could be enjoyed by everybody). They realized that between them they could recreate anything that had ever been—or anything that had ever existed strongly enough to leave its impress on time in patina-form, for patina is the living precipitate of time. On the basis of this they drew up the Landwitch Covenant to serve as an Enabling Act. (Abel Landgood spelled it en-Abel-ing Act on his copy—he was a good-humored man, but specifically his humor was quite bad.)

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Needing guidance, the two men joined forces with John Dragon, the dean of soft sciences at Southwestern Polytech and with Cris Benedetti who was professor of miscellaneous subjects. Dragon got an appropriation (mostly travel money) to test the Covenant in a puzzling historical situation. Cris Benedetti took the two talented gentlemen down to Barnaby Sheen's electronics shop where two young electronic geniuses—a smooth-faced young man named Roy Mega and a hairy-faced young man named Austro—built imposing and sophisticated instruments that would reinforce the talents of the two men and would also give a scientific appearance to the enterprise.

"I believe that the patina-deposit complex is so complete," Joe Waterwitch had said on the eve of their first monumental testing, "that it would not greatly matter if all life should suddenly disappear from Earth. Secondary life would spring from these deposits. The many millions of micro-books written on skins (on the skins of rock, on the skins of everything) would bring forth recreated life—whatever life was most ready and most avid to be resurrected. I believe that I have already experienced glimpses and manifestations of the reactivating mechanism. It would be a curious life and a curious world then. Everything in it would be the ghost of something that had gone before, but the combinations would be new, the motifs and forms would be completely fresh. It would not be a sequential world or a rational one. Anomaly would be the characteristic. It would be like—"

"It would be like the world we live in now," Cris Benedetti said. "You have described our own world perfectly and I suspect that your thesis is correct. We live in a recreated secondary. All life *did* suddenly disappear from Earth—I'm not sure when this happened. Secondary life, made up entirely of anomalous ghosts, did spring up from old residues written small on various skins. We are the anomalous ghosts and this world is our world."

"I believe that there are a few slight objections to your theory," John Dragon said with that deadly seriousness that is found only in citizens of secondary worlds. "There are so many things about us that have to be happening for the first time. There are things too flimsy ever to be reproduced. However, we may be living in an abortive secondary."

III

THE constituted body known as the Landwitch Covenant—that para-archeological investigating team—failed its first major test. Its little movie, *The Fall of Damascus*—filmed on a working site—may well have been the worst movie

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ever made. However its failures came about, it was sick parody, ridiculously false history and it simply could not have been a resurrection of the past. It received bitter assessment from the scientific community, for the para-archeological probe had been represented as somehow scientific.

The whole group had been completely discredited—and one Khalid had been voted the ironic award of "Worst Actor of the Year, of Any Year."

"They give us no credit at all," Abel Landgood complained. "This is the first movie ever made to consist entirely of complete ghosts and complete ghost sites. Who else was ever able to evoke an integrated past so entirely? And of course it is scientific! What else could it be? Admittedly there was something the matter with the past that we evoked, but we'll solve that too."

"'The worst actor of the year, any year!'" Khalid fumed. "I'll show them—"

"Can you get another appropriation, Dragon?" Joseph Waterwitch asked.

"No, I'm out completely," John Dragon said sorrowfully. "Ragged, bagged, tagged and fired from Southwestern Polytech. 'You're making a mistake,' I told them. 'You're destroying the balance of things. You *need* a dean of soft sciences.' 'Not that soft,' they said. Did you ever watch a ceremonial academic putdown? They cut the brass buttons off my dean's coat, broke my plate and turned my picture to the wall."

"Worst actor of the year!" Khalid smoldered. "I'll make them eat that! I don't know why I came through so badly, though. That wasn't the real me."

"It isn't fair," Waterwitch groused. "We're put clear down, but everyone who touched us comes up smelling like lilacs. That kid Austro who works for Sheen, he has a writeup and an article in the latest *Geology This Month.* The article is *Instrumental Reception of Igneous Rock Mantle Data by Means of Pulsating Heterodyning Grids,* and it's subtitled *Search and Focus, or Do Rocks Remember?* And talk about a gadget! The kid must be a freak. It says the 'manuscript' for his article was chiseled on thin stone tablets."

"Who does he think he is—Moses?" Abel Landgood exploded. "He's a friend of yours, isn't he, Benedetti? What kind of friends do you have anyhow?"

"Right now, all of us need all the friends we can get," Cris Benedetti said.

"Worst actor of the year!" Khalid still moaned. "I'll rub their noses in that before I'm through. But why wasn't it the real me?"

"Maybe Austro can devise a filter for excessively polarized data," Cris Benedetti said hopefully.

"What hurts is that Austro was working for us and got his ideas

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from us," Waterwitch insisted. "And *Geology This Month* describes him as 'highly professional and impeccably scientific—if he were not so, his theories would be grotesque.' If that fuzz-faced clown is scientific, what are we?"

"Some have it, some don't," Cris said.

"He used us."

"Then we'll use him," Khalid said reasonably. "There's no doubting it—that kid has drunk from the older river. That means that he can enter and infiltrate and topple—and that's what he *is* doing. There have to be such manipulators working behind scenes whenever you go into the business of tumbling walls down, and there have to be these awkward stalking-horses out in front. Though I never before thought of myself as a stalking-horse."

"Well, just what *are* you, Khalid," Landgood asked, "and what are you doing here?"

"Yes, we've all been wondering that," Cris Benedetti said.

"You're a residue among residues," Joe Waterwitch said. "I focused on you and Abel Landgood catalyzed you into apparent being. You're a ghost, a recreation from the past. You aren't real."

"What man is sure of his own reality?" Khalid asked. "Are any of you? We desert people have gone into this much more deeply than you Franks have. Thinking isn't your line. But you clods precipitated a Khalid as seen through Damascene-Byzantine eyes. No wonder I was selected worst actor of the year! Why didn't you catalyze the real me, the shrewd, brilliant, spacious, nonpareil political and military genius, the leader of the canniest and trickiest and most sophisticated bunch of men ever assembled?"

"Ah, because our data was polarized," Cris Benedetti said. "We tuned in on residues and patinas as seen by Damascene eyes because those were the eyes that predominated in Damascus. That's the way you looked to those city people, so that's the way you looked to our instruments and film. I believe that it could have been corrected if we had had a little more experience in these things. But it's all water over the dam now."

"No, no, water *under* the dam," shrewd, brilliant, spacious, nonpareil Khalid said evenly. "Oh, that water is our salvation! Let's go see those kids. Somehow they're at home in the other river."

"How come you speak English, Khalid?" asked John Dragon, the ex-dean.

"More polarized data," Khalid explained. "I don't really. But you know me by your own polarized English-speaking minds. So to you it seems as if I speak as you do."

"ARE you still in good graces at Polytech, Benedetti?" Landgood asked as the men (and a con-

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tingent man, Khalid, a barefoot ghost in odd robes) walked the half-mile down Six-Shooter Road to Sheen's electronic works.

"Oh, they've given me a sabbatical," Cris Benedetti said. "They said that I needed a rest. It's fine, I suppose, but it's without pay."

"Won't it be a little hard on you to go a year without pay, Benedetti?"

"It's seven years. They convinced me that a sabbatical is for seven years. They also said that the sabbatical was renewable. They've always been nice people to work for, and they're scientifically orthodox. Some of them will appear on tonight's great TV news Spectacular, SCIENCE SUPREME, THE END OF THE CRACKPOTS."

"Which are the crackpots?" Khalid asked.

"Such as ourselves," John Dragon said. "Para-archeologists and such."

"No, no, they're wrong," Khalid protested. "Because a thing is done badly, as your thing sure was, is no reason to throw it away. Keep with it."

"That other genius kid, Roy Mega, is just as ambivalent as Austro is." Abel Landgood sighed. "In the latest *Para-Electronics Today* he is quoted a bit. I'll read it: 'The scientific community may be a little too prone to suspect vivid depictment of time-residue data. Why should such representation not be vivid—as long as it is valid? The translation of residue data falls as easily into anthropomorphic forms as into modified sine wave or any other graphic form. It is no real indictment that a translation of residue men and sites should look like men and sites. However, we cannot condone the excesses of certain adventurers in their recent extravaganza. As the boys say, *Do not task us with Damascus.* That was a sad and discrediting thing. We wash our hands of such excesses.'"

"With which water does he wash his hands?" Khalid asked. "From which side of the she-wolf does this cub suck? Ambivalence may often be its own best tactic, but not always. We will see."

"There's more," Landgood said. "He writes 'We must begin to accept even the fleshing of time-residue ghosts, just as we have arrived at the fleshing of T.V. images. Yet we do well to be suspicious if they are of too funny a flesh. Malodorous and deformed ghosts disprove themselves.'"

"I'm one of those he means," Khalid grumbled. "Worst actor of any year! I'll come back on them. I'll rub their noses in it."

"He goes on," said Landgood, "'We, along with all responsible scientists, must reject these current debasements of—'"

Landgood, reading, collided with Roy Mega, who was strolling in front of Sheen's electronics building.

"It's good to hear oneself quoted

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with such total preoccupation," Roy Mega said. "Gentlemen—ah—I see that you have one of the funny fleshies with you."

"A care, young colt!" Khalid said with barefoot dignity. "I have dined on infidel tongues before and I'll have yours out by the roots. There's a special flavor to the waggle-well, young-fool tongue."

"A care, old nag," Roy Mega said with gathering hubris. "You aren't real and you aren't here. You are no more than the experimental after-image of a bad motion picture ghost. As an after-image you are my experiment and I can terminate you easily. Your apparent continuation after the show and its recording were finished owes itself to a trick I intruded into the equipment. Your appearance depends on one holding coil, one small electromagnet, that I set in the circuits. And it is a time-release holding coil, so your continuation is quite precarious. In fact, it should—"

"The coil should have released itself some hours or days ago, should it not, young colt?" Khalid smiled. "It should have released itself when my days of grace were finished. These were the day during which I tracked down these men who had had something to do with my wakening. I wanted to find out why I had come through so badly, why it wasn't the real me. But now there is more than one holding coil in the equipment you built—and more than one in equipment that you know not of. Oh, I've insured and reinsured the circuitry on which I depend. I am even on the verge of making myself independent of all circuitry, of making myself of less funny flesh, of becoming again more than an electric man. Why should my continuance depend on fleshless circuitry? There is One on whom all depends."

"*Carrock,*" said Austro, the young, hair-faced electronics genius, as he came out of the electronics building.

"A stranger colt, you," said Khalid, turning pleasantly to Austro. "You at least, if not the other, have drunk from the hidden and intuitive river. You at least can circumvent and enter the walled city. Possibly of funny flesh yourself, but yours is a greening genius from that hidden water."

"Mud on my mouth, I have drunk from it!" Austro declared. "And so also has Roy here. He is as conniving and cantankerous a person as yourself, good Khalid. *Carrock,* why don't we all come inside?"

They all went inside.

"THIS Roy boy, this dolt colt here, he is *not* as conniving as myself," Khalid preached when they had settled indoors. "He does not make sure. He does not check back. Had I placed a time coil in an equipment, I would know it when the time had run out and the coil

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had forgotten to release. Could so careless a young man have taken Damascus? Could he have taken Ctesiphon or Baghdad?"

"Like Grant took Richmond," Roy Mega crowed. "Like Sungai took Dashbashpul."

"*Carrock,* kids. To peace and to work," Austro poured aromatic oil on the hidden, intuitive waters. "By the sour'd ears of science, we have more to do than set a-blowing the sand of old battles. *Carrock!*"

"Are you a fancy-talking hair-face?" Khalid asked him. "But I believe that I have heard that you are only a device manufactured by the jinni named Sheen."

"Oh, Austro's real enough, Khalid," Cris Benedetti assured the out-of-time Arab when they were all at ease in the lounge of the electronics building. "And Austro is right. We have to set a-blowing the sand of *new* battles. Now. But how will we do it? The great walls of science are guarded by so many that not even a mouse can get in. They even have a battalion of a thousand and one furious mouse-hunters. And the bright pennant SCIENCE SUPREME, THE END OF THE CRACKPOTS will fly over those high battlements tonight. Khalid, we do need an old desert warrior here."

"I am the greatest ever," Khalid answered them. "But several times all of you have spoken of science without total respect and this I do not understand. We are talking about the same thing, high science, *Ilm* itself? I thought that science was all to the good. The Byzantines believed that they had come to the end of it—we knew that we had just come to the beginning of it, but we came to that beginning with joy. We ciphered more intricate mathematics in the sand than they in their scrolls. We studied more complex starways from our sandy hills than they from their towers. We brewed more chemistries from the bark of one incense tree than they from all their archive dust. At desert smitheries and forges we built instruments and machines beyond anything they imagined. And we made a rhetoric and eloquence to carry on and announce these things. After Him whom all adore, we most adored science, the holy *Ilm.* And you now hold science in bad repute? Has the Byzantine contempt and satisfaction come back? Has the wheel turned a full circle? It's almost as if we hadn't whipped them completely."

"Yes, the contempt and satisfaction with past knowledge have come back," John Dragon said sadly. "And they have encrusted the thing itself. The noble old ship is sluggish and bottom-heavy with barnacles. The Free Brother of man, your holy *Ilm,* has imprisoned himself behind walls and is no longer free."

"We know how to enter and throw down walls," Khalid said. "You, the two young geniuses, get

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you busy instrumenting it. There will be an event, will there? Then we will capture and ride that event. We begin the assault tonight. We will assail the encrustation from inside."

"This isn't Damascus, this isn't Baghdad," Abel Landgood said.

"Yes it is," Khalid insisted. "The encrustations, the wallings, the enclosures—they are Damascus, they are Ctesiphon, they are Baghdad. Young geniuses, are you at work on it?"

"Ah, I'm not quite sure what—" Roy Mega hesitated. "We've been using doubletalk and we've been washing our hands a lot. I don't know what else—"

"*Carrock,* I'm sure, I know," Austro said. "Here, Roy, come work. We make *them* use doubletalk in their own mouths."

"If I only knew what we're supposed to be doing—" Roy Mega complained.

"If you have to ask you've missed it," Khalid told him. "Surely a smart young man like you wouldn't miss it. We need your fine hubris. We need your sharp distinctions. The noble thing itself will be bruised a bit when we tear through its encrustations, but noble things are always tough. Come, come, Frankish men, we need the fine edge of your minds for our polarity. What we really need is irony, a little unconscious irony."

"That's the hardest kind," Cris Benedetti said.

"It's almost time for that damnable TV Spectacular SCIENCE SUPREME, THE END OF THE CRACKPOTS," Joe Waterwitch said through clenched teeth. "I will hate the smugness of it, the exclusions, the cursed closed-mindedness. And yet I'll be fascinated by that whole barrel of snakes and I don't know why."

"*Carrock,* so will I, and I do know why," said that young genius Austro. "Is it two receivers we will set up, Khalid, sir? That way we can have one that shows what everybody sees and the other one to show it the way they're really doing it. That one will be tricky, but very instructive. We will need to follow it along as we go so we can modify our patterns. We have to know what it is that we're heterodyning."

"I can do it," Roy Mega said. "I was slow to pick it up and that isn't my way at all, but I know I can handle it now. Exquisite shielding for the check-set, and unscrambling the scramble! It will be the only set in the world to show our process in unmodified form, a real curiosity. And the modified one will show the full flowering, the tilt, the scramble. There's no limit to it—or to just how good we really are."

"Is there power enough for such amplification?" Cris Benedetti asked. He wasn't an electronics man.

"Electrically, yes," Roy Mega said. "Mentally—that's up to all of us. And be not quite your usual kind self, Mr. Benedetti. We need

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a little urbane arrogance and we need it from you. We need a little elegance from someone. Is there anyone elegant here besides me? Contribute, men, it is almost time."

"*Carrock*, we hope, we hope," Austro howled—and he was modifying equipment faster than you could blink.

"It shouldn't take much electricity," Khalid guessed. "We took Damascus with only crude sparking coils and primitive Greek fire to reinforce our own mind-worm bit. Of course it took us six months. And our new assault will take us six months or six years or sixty, but we will finish the beginning of it tonight. As to the power, it couldn't have been more than a nudge the wrong way during your reactivation of us that turned me from the consummate genius and masterful personage that I am into the worst actor of any year. This is the subtle touch that seems to change nothing and changes everything. One will hardly be able to point to any single element that is changed at all, yet the totality will absolutely be changed."

"What is going on here anyhow?" John Dragon demanded.

"The damnable TV news spectacular, SCIENCE SUPREME, THE END OF THE CRACKPOTS is going on in thirty seconds," Cris Benedetti said. "It's to the first audience of one billion persons ever. Be angry or be easy, Dragon, but be yourself.

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The world is going to see this show through *our* eyes and attitudes. We msut give the world a really fine and new experience. Polarized data! The field has hardly been touched. One can do many things with it."

"Mind-worms—we will be mind-worms," Khalid said. "We are inside them all. We begin the conquest now and they'll never know what hit them. We ride the current of that intuitive river named Pharpar. We make the whole world see it all through our own elegant eyes. I like that 'elegant eyes' part."

"But we can't alter a TV program that is going on," Joe Waterwitch protested. "We would have to do—"

"We are doing," said Roy Mega.

"Joe, you're the dowser and you don't know where it's at," Benedetti chortled. "Certainly we can alter it if we bring our equipment and minds and eyes to bear."

—

IT WAS quite a good TV Spectacular. SCIENCE SUPREME, THE END OF THE CRACKPOTS, was the first presentation ever to have more than one billion viewers. It was a program that people would remember—it would affect them for the rest of their lives.

It wasn't quite what had been expected. The crackpots—they came through as the entrenched inner sanctum boys. It took a lot of courage for the scientific community to confess to such weaknesses in itself.

And some of the things that you had always thought of as a little bit fringe, ah, they got the open-door welcome here. A few of them set you and the whole world thinking on new lines. There has to be something to them: there has to be a lot to several of them. Take that new para-archeology, that especially. By a combination of electronics and human minds, great hunks of the past are really recreated. Old ghosts walk and they do not look ghostly at all.

And often, in the electronics building there, a glance at the check-set to see from what rough rocks these men present had fashioned such elegant gems! That original had been rough and intolerant. It had been smothering and shriveling. But the check-set was not seen by the billion, only by the seven.

Oh, but the great and gracious modification which now became the prime original. (Yes, the Noble Thing itself was bruised a bit when the modification tore through the old encrustations, but noble things are always tough enough to survive: and now, for a while, it was no longer smothered and shriveled.)

But the final, elegant, polarized presentation was like an old promise fulfiled, like a hidden river rediscovered. It was an unfolding, a full-flowing. It was finally to see all dimensions of time and space with the elegant eye. ★

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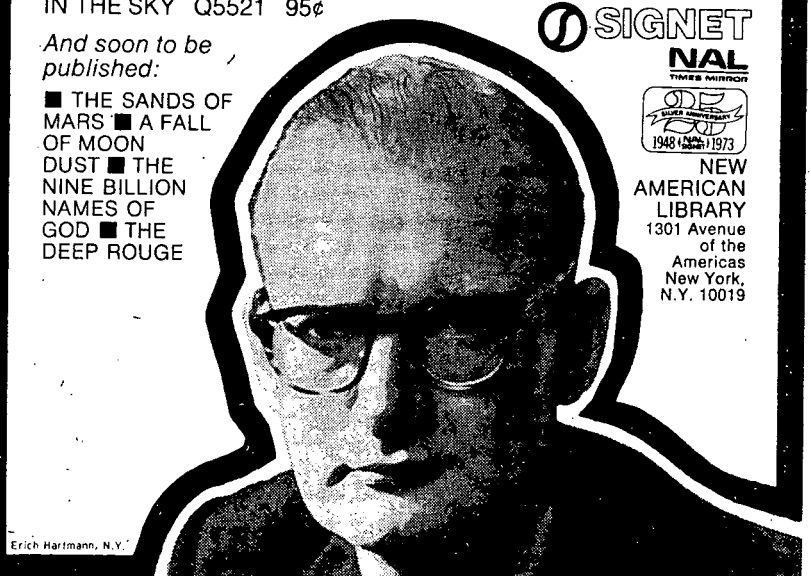

Erich Hartmann, N.Y.

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PROTEST

The Earth he had sought to change had fled him—all but one last corner of it!

PETER TATE

THE OVERGROWN and choking garden was shaped like a guitar with a hedge of pure Gibson box; the jaded, magnificent dying room was furnished in Spanish cherry-wood; he slept last night in a Fender cutaway and, sweet Pete Seeger, even his home telephone exchange had twelve strings.

Jacob Grass. Gone today, maybe here tomorrow. The world stopped listening and advancing years impaled the minstrel. He calls himself a victim of bad taste but in actuality it was just the taste, any taste, new taste, that polished him off.

Jacob Grass with a bowl of hot wax upon his knee and golden hands working in it, salvaging the joints, dispelling the cramps for a small while.

Then the digits came up like candles and he toweled them clean and reached for his peeling Gallacher. Jacob was going to sing his song before finger warmth and all daylight went. Daylight was vital, though he played with his eyes shut. In darkness he could not see to mix the wax.

How do you equate an active telephone exchange with a lifeless electric system? Jacob Grass had no lights, which he needed, and a dozen primed lines which he did not. Why?

Hope.

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Hope doesn't need light but it does need contact. Jacob had heaved himself clear of the Nashville debris and headed for Hollywood with some idea about his and the old dear's dying together. Finding a place was easy enough—their doors were open and begging along upper Hollywood Boulevard when he had been expecting to hike deep into the Cheviot hills.

The Haunted House, some seer of the sixties had called Hollywood, and that was just how it was now—only more so, with the rest of the midway packed up and gone and the squat hulks hardly holding up under the weight of the winter.

And to find here a dwelling so given over to the motif of his heart—that was more than good fortune. That was the beginning of hope.

So the phones stayed, though the power company came and looked at the ghost town and then sent an in-spectre to scare Jacob into paying his bill. One look at Jacob, though, and they knew it wasn't worth the legal trouble because you can't get blood from a rocking horse.

Maybe they were even plotting with the phone company but something kept Grass safe and whenever he picked up his handpiece, the buzz invitation was there, sure and penetrative, meaning, *Your call, sir?*

Likely there was an engineer somewhere along the lines who remembered Jacob Grass with affection for the songs that had said all that the engineer had always wanted to say about war, women, work or whimsy.

No doubt about it, Jacob had spoken with the tongue of tongues once upon a merry time. Now he composed to himself and swore because the rhymes were ragged or the meter didn't run true.

Jacob Grass and Hollywood. A strong affinity and the only affinity you would find here.

The people walked out on Jacob. The people walked out on their celluloid dreams. Time had been when Fox, Warner, Universal could dictate the direction for mass escapism with only a limited number of other choices. But now, at the thin end of the millennium, there were so many brands of reality and so many eyes with which to view them that dreams were redundant.

For instance, in a typical day:

The Northlands Satellite was beaming the survival struggle of a crashed plane crew in the Arctic Circle by daily episodes. Any time—maybe tomorrow, folks—the pilot, dragging his broken leg, was going to start hacking chunks off his dead Eskimo passenger or the copilot or the beautiful mortified stewardess for fresh meat and strength.

Spangles McGraw was plugging his/her latest crunch every time you turned up your transvestite radio.

There was *Show Your Cards*, an extravaganza from Central Africa where the Malawi Young Pioneers had lined up another round dozen

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unpolitical animals and were proceeding to burn their homes, pillage their limbs and wreck their wives just to see how much it took to make the dissidents join the Party.

Seoul Brothers, the recruiting splurge from the Indo-China theater, was always good for a laugh.

You could watch people dying on a dozen different channels, near and far, traffic control or Skylab mortality quotient.

With all that, who needed fantasy? The cameramen had gone to the top of the pile. There was even *If It Kills Me . . .* a kind of television consequence game that used up its production staff like crazy because the title was the sum total of the scenario. And Hollywood continued deserted, left to wraiths like Jacob Grass who came to stay forever while ancient stardusts drifted in doorways.

The same manifestation. Jacob had sung protest songs and the enlightened had listened. But the mass had gloried in the very things he decried and he bothered them. Crazy Jacob. Chase him away. And kill off his listeners. All flesh was not Grass.

I'm the man who taught the people
How to think before they sing,
How to look for little hitches
And examine everything.

SOMEBODY moved upon the thickening grime of the boulevard. A young man tensed to the sound—a faint jangling like a music box in a high and distant room.

He put his weight against the fluted magnificence of the gate. Its rustings came away on his glinting hands and his fibrous suit but it gave inward and before he was three paces up the path the oxide had been shaken off like sand.

Following the music to its source, he skirted spent azalea bushes, trod carefully upon fissured mosaic and came at last past a fall of bougainvillea to a patio and an open french door.

By which time the guitar had stopped.

Jacob Grass had heard no footsteps save his own for a long time. Suppliers of sustenance stopped their vehicles to unload cartons at his gate. Mailmen opened his box and collected the small checks for the butcher, the baker and the candle-wax maker. The other envelopes—the offers of work and the fan letters he had written to himself—they authorized with a handstamp and replaced. All out of his earshot.

But now there were footsteps. And stepping from light into gloom, a young man of slightly soiled elegance with a miracle looped to his wrist. Jacob Grass knew a camera when he saw one.

"Well, for crying out loud," said the young man. "A living soul. Dr. Living Soul, I presume."

Words crawled in Jacob's throat

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but were reluctant to be uttered. A second voice, suddenly.

Let it speak its fill and let me listen.

The young man chuckled and panned the room with his eyes, cutting from pool of shadow to splash of light, sunfall to gyrating column of dust.

"Are you at one with this place, dad? Is it yours or do you squat?"

Jacob found expression at last. "It's mine."

"How long? Mercy, I never thought to find anybody actually still here. Then I heard a guitar. You got records?"

"I've got fingers," said Jacob. The Gallacher lay across his legs and only now the intruder's vision was coming around to him.

"You mean you play?"

"I play." Jacob didn't like the way the kid said it, as though there were some dishonor involved.

"Here?"

"Nowhere else."

"But why?"

"Because I want to."

"What are you doing here?"

"What is anybody doing anywhere except waiting to die?"

"Wait a minute—do you mean to say you're—like—in sight of death?"

Jacob couldn't see the point of the questions and the boy was supercilious, anyway. "What if I am?"

"Well, maybe I can help you."

"To die? No thanks. That's one job I keep for myself."

"No, pop. Don't misread me. What I mean is—somebody at a low ebb like that. Sometimes it helps to have a friend. Like to push the tide back."

"You mixed your metaphors. I notice that. I keep it out of my lyrics."

"Lyrics?"

"Songs. I have written songs that are loved the world over."

"Great. Are you David or Bacharach, Killjoy or Vespucci?"

"Jacob Grass."

"Jacob Grass?"

"Do you know the name?"

"Sure I know it. Ah—folk songs." He could tell by the acoustic guitar.

"Protest."

"Protest, I meant."

"There's a difference."

"I appreciate that. Dylan made the point—"

"Listen, I had more to say and I said it better—"

"Of course you did, Jacob. But just the same, now you're—"

"Dying?"

"Living. Living, Jacob, here in this—string mausoleum. People should know."

"They'll know soon enough. I get offers all the time. It's just a matter of picking the right one."

The young man was aiming his Minolta, swinging it hither and thither, testing black-box attachments that set him right for film speed and aperture as he dry-shot darkness, light and Jacob Grass.

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"I know I can help you," he said. "I have some friends who would be transported by this old house and you and—and the whole scene. Do you mind if I bring them?"

"Do you have a name?"

"Sure—forgive me, Jacob. Clements, my name is—Asa Clements. It's kind of funny—like you get 'ASA' on films? Or maybe you don't know that."

"Asa Clements?"

"Do you know the name?"

"Of course. You take pictures." He could tell by the camera.

"You're playing a game, Jacob."

"Your game, Asa. You don't know me from a bag of grit."

"That's not true, Mr. Grass. And let me tell you—before long people will be falling over themselves to get to know you."

"With your pictures."

"Maybe a little of the glitter will rub off on me, yes."

"So tell your friends. There'll be enough glitter for all."

Past the bougainvillea, across the cracked tiles, through the barren bushes to the gate, Asa Clements was counting his friends. Not the ones he had, because he had none. But the ones he was going to make as a lone wolf cameraman with some off-beat footage.

The networks beckoned. Asa went to sell his project and beg some film.

I'm the man who told the people
Life is not what it appears.
Media lie and they've been
Doing it for years.

CONTROL room subdued of illumination and numbers crawling like flies upon one wall while above them Amazon natives fried a missionary in high color. Mr. Gianni Intermezzo was post-synching birds with their songs, cicadas with their rattles, screams with their sources.

"And you say this man is dying?" He did not hesitate in his work. Cut, thrust, splice, run and all the time the jungle sounds were learning to be punctual.

"He says he's dying," said Asa Clements, "and that makes it more authoritative. Just a thousand feet, taken at the proper time, would do it, Mr. Intermezzo."

"Why come to me?"

"Because you're the best."

"The best what? The best push-over?"

"I'm not asking for a handout, Mr. Intermezzo. I'm seeking the wherewithal for a project that will do you far more good than it will ever do me. Slap your name all over it but just give me camera credit."

"How certain are you this—Grass—won't welsh on us?"

"Welsh on us?"

"Carry on living. Waste our endeavors."

"Because he volunteered the information without knowing who I was."

"Does he know now?"

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"Of course not. What do you think I am, Mr. Intermezzo?"

"Would you believe a vulture?"

"I'm a buzzard in a buzzard world, Mr. Intermezzo, and anybody who tries to pass himself off as anything else is just airs and graces."

Clements watched the airs and graces on the flickering wall. The woodland fire was burning low and some of the natives were risking their soles to prod the crackling body at the stake. His stomach turned. As a defense against nausea, his mind put up one of the maxims beloved of his profession: *If you don't like the heat, stay out of the kitchen.* But suppose, Harry S. Truman, that the kitchen covered the world.

Intermezzo watched on, unmoved.

"What—" Clements swallowed. "What do they do next?"

"Nothing."

"Nothing? Don't they eat him or—some kind of ritual?"

"What for?"

"Well, it's—I thought it was their practice—"

"They don't need practice."

"I mean—their custom. What's expected of them."

"Where's the thrill in the expected?"

"I'm not sure we're talking the same language, Mr. Intermezzo. Where's the thrill in doing nothing?"

The film was backtracking now, over the treetops, higher and higher until the river was a ribbon and the jungle was unbroken. The incident and the lost life were gone as simply as that, like a pebble beneath the surface of the sea. Intermezzo let the question hang until fadeout.

"All right," he said. "Because we may do business I'll honor you with a context. How to make sense of this scenario. The missionary was burning at the stake. Why?"

"I—" Clements stumbled. "I—guess they didn't like what he said."

"What did he say?"

"I don't know. Maybe he made vague promises."

Intermezzo lit up his workroom and grinned. "You're getting the picture. Would you say that was enough reason to kill a man?"

"I've heard of slighter reasons."

"In the context."

"No."

"Then what are they doing?"

"Putting him to the test?"

"Splendid. And what were the alternatives?"

"They could kill him or let him live."

"You're going away from the story. They've mounted the test. What then?"

"When the fire's lit—he can only die."

"Perhaps he claimed differently."

"Then he's a fool. There's only one likelihood. The rest are impossible."

"Even with faith?"

"Faith doesn't make the steam-

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roller jump over you. It just helps you to know whether what you're dying for is worth it."

"That's more profound than I expected, Mr. Clements. I am beginning to like you."

"I'm gratified, Mr. Intermezzo, but I'm not sure I grasp your meaning."

"Think about it. You see, that film finished where it did because the natives had made their point. No melodrama, no special effects, no impossibilities. That's what I call integrity. And when I give you five hundred feet of film, it's what I want."

"But that's barely enough to—"

"Keep a record? It's all you need. There'll be no second take. Pick your moment and economize, Mr. Clements. Economy is a great virtue. And listen: when I talk about integrity I mean integrity and about integrity I mean integrity from Jacob Grass and integrity from you."

"You'll get it," said Clements weakly.

Intermezzo stabbed his thumb at the blank screen wall. "Make your point in five hundred feet. Make sure Grass knows what he's dying for. Otherwise—"

Otherwise it's me for the torture stake and somebody else's five hundred feet. If you don't like the heat . . .

But the world goes on burning just the same

And there's no volunteer to take the blame.

ASA CLEMENTS answered to Gianni Intermezzo. Intermezzo stepped to a different drummer. He locked up the control room, donned a polaroid visor against the intensity of the downtown Los Angeles light and headed for the nearest hologram terminal.

There he dialed his sponsor, no less than Frank Baker, the protein billionaire. No chance of getting to Baker, of course, but today was a good day. He came within three doors of the top. The man whose foreshortened features shaped up on the hologram link was Charles Natchez, a well advanced chief of staff he had met before. Natchez remembered the movies with affection and kept a soft spot for flotsam like Intermezzo.

"Gianni," he said. "Always a pleasure."

"Pleasure's all mine," conceded Intermezzo. "Charles, I have set an item in motion."

"Well, you know we respect your judgment, Gianni."

"My judgment's all right. I'm calling to apprise you, is all. I can't give you a completion date, although the feeling I have is that this is a quickie."

"How many reels, Gianni?" Natchez loved the chance to get into the vernacular.

"I advanced the boy five hundred feet of film. It should be more than

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enough for the project he has in mind."

"Are you going to tell me about it?"

"This old folk-singer. Name of Jacob Grass."

"Jacob Grass—"

"You know him?"

"I can't be sure. I'm just making a note."

"Well, I know him and I remember he used to be good. There could be some beautiful things said—"

"Not too many, Gianni. Not in five hundred feet."

"Forgive me, Charles. But I know my limitations. Twist it any way you like, it doesn't take long to say, 'I'm dead'."

"And you believe he'll do this?"

"Naturally."

"And mean it. We have to have the action, Gianni."

"I am assured he has no stamina to change his mind even if he had the intention."

"Just the same, he'll have to be checked in the usual way—checked that his insurance is paid up, that he has no friends who might dissuade him, that his medical degeneration is rapid, that he actually *wants* to go."

"My contact claims all these requirements are fulfilled. Grass is tired of living."

The head of Natchez, projected there at the mouth of the tube like a genie, blinked and nodded. Intermezzo had an insane desire to reach out for the image, tear the head from its moorings, smash it to the floor just to see what happened. But he kept his hands out of sight, knowing it was an impossible murder. There would be no more effect than a flickering of colors on his swinging fists and, more, Natchez would see the movement and recognize the intention. It's hard to go on talking business to a man when you've just proved you'd like to kill him. Intermezzo kept his hands and his thoughts out of sight.

Natchez was still nodding. "You know it only takes a good idea to change a person's mind in these circumstances."

"That's a gamble I'll take. Believe me, if there was a good idea to be had, Jacob Grass would have had it. I'll organize the usual safeguards."

"Otherwise—" Charles Natchez laughed and brought his hands over the edge of his desk. Intermezzo could see them there in miniature, like moth wings. Then the little hands were sweeping across the expanse of the image. Muscles tightened in his neck as he realized what Natchez was doing. What he could not afford to do. "Otherwise," chuckled the genie, "heads will roll."

I'm the man who thought the people
Would be glad to know the score,
With a great big smile of welcome
When they opened up the door

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THE TELEPHONE RANG. It shuddered the ancient chandeliers until they shed dust like rain upon the startled house. It jerked Jacob Grass's hands so that he spilled molten wax upon the dull tile floor and put his feet in it and toppled before he knew what he should do about the phone.

And it kept ringing.

Asa Clements, at the other end, reasoned that Jacob was finishing a solo or mesmerized in some other form and waited while motes fell and Jacob cursed and scrabbled. Waited and thought how kind he was.

Eventually: "The Jacob Grass residence. Who wishes to consult with him, please?" Grass doing his wrinkled retainer bit.

"I wanted to speak with Mr. Grass if he is not too busy," said Clements, grinning at his own sophistication. "My name is Clements. He may remember me."

He had to remember—it was only the day after.

"The man with the camera." The voice was the same. Grass had wearied of the game. "Of course I remember you, Mr. Clements. I wasn't expecting you to phone."

Jacob had not been expecting anybody to phone. For some reason he had had the cameraman earmarked as someone who would come through the french door again next time. All the same he was curious. He hastened to amend and explain. "What I meant was, I didn't realize you had my number. Is it—"

Clements read him. "Yes, it's listed, Mr. Grass. Large black capitals: *JACOB GRASS, PROTEST SINGER, HOLLYWOOD BOULEVARD.* It looks just fine." He had taken the number off the hand-unit at the house.

"You lie too easily, Asa," said Grass. "You lie for almost no reason at all."

"I—" Clements dried up.

"You what? Were you going to deny it? Were you going to compound your felony?"

Five hundred feet of film and Asa Clements had been wondering whether it would be enough. The danger now was that he would not get to use any of it.

"I'm sorry," he said. "I—I try to be kind. If an old man has a dream I try not to spoil it or trample on it. In this ghost town the directory is full of dead numbers, Jacob. I thought you knew that and I was echoing your charade. Don't think too badly of me. I have some good news."

"Is it the truth?"

"It is as good as that. I have been invited to make a film about you."

"What do they want me to do—jump off the roof? I'm afraid I couldn't climb up there."

"No, Jacob. A film about the way you live. Your songs. It could do you a lot of good, bring you a-lot more work."

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"Are you still trying to humor me, Asa? I see films. They all have one ending these days."

"Truly, Jacob." Well, he could put it in a way that wasn't too much of a hypocrisy. "I have five hundred feet of film to use on you. You can do what you like, say what you like—play what you like. And if my contact likes the result there could be more footage. Don't say you wouldn't enjoy being a star again."

Jacob Grass looked down at the cute little receiver in his hand and wondered if he could be brave enough to replace it on its cute little stand. The cameraman's offer was seductive, allowing for any and all consequences.

But there were other entirely professional considerations. He needed time to think on those.

"You can't come here," he said. "I don't want to see you. The hell with your five hundred feet of film—and I still have enough strength to break a camera."

For courage, read cunning, he thought as he cradled the receiver. Clements would be across the ferrous oxide threshold and lurking in the shrubbery with very little delay because he was already committed to Grass. Keeping his distance, but waiting his chance.

Jacob, meanwhile, had all the time he wanted to work on his act.

I'm the man who begged the people
It was truth I had to say,
But they just turned up their 3V sets
Until I went away.

On his last day in the crumbling mansion, Jacob Grass awoke laughing. Hammering life back into his stunted hands, laying them to thaw in the sunlight upon the windowsill, he perceived what he could do.

This very window frame. The others around the house. All could be utilized. He drew his fingers back into the shadows and set them searching for screws and driver.

Twelve screws to the top of each frame, grouped in twos, twelve screws to the bottom and paired. See how far they went.

And when he had used up his own supply of loose screws, he toured the house dismantling doors, discarding mirrors and pictures and handles. He vandalized fine furniture for the small spirals that kept it together. He plundered comforts for the joints that made them so.

And in the end, ten window frames were studded top and bottom, couple by couple.

So much for the mechanics. Now for the art.

He used half his remaining supply of wax to resupple his hands and kept the rest for a more vital purpose. As hunched as Quasimodo, he scaled the stairs to the attic and broke open a box that bore its age in cobwebs.

Strings. Curled, looped, plaited,

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laid flat. Catgut, steel, nylon. Knotted together, they could reach the moon but Jacob Grass needed them as individuals. All bore small labels identifying their key. He shoved and pummeled the box to the top of the stairway and dragged it to the first floor.

Then he started on the first window.

Working from left to right, a bass string and then a treble wound at either end around a screw—*E,A,D,G,B,E.*

He left them slack and moved on to the next window—Bass *E*, Treble *E*, Bass *A*, Treble *A*, Bass *D*, Treble *D* and on into *G* and *B* and *E* again.

Moving on. Take a pair of laughing *E*s, a brace of *A*s, a deuce of *D*s . . .

He made a song out of it. Not up to his usual standard, maybe, but then the lyrics were not important—this time he would use no lyrics.

Five windows strung and Jacob Grass was humming. Seven windows and Jacob was gritting teeth against the pain in his paws. Ten windows done and now came the tough part, the part that cried out for craftsmanship.

His strings needed wax but so did he. And if his fingers didn't get it, the strings never would. He split the small block in two again, made it liquid before the fire, laid his digits to rest.

It was mid-afternoon and he hadn't eaten, his stomach told him. He committed his hands to the towel hurriedly and scrambled for bread and cheese, not heeding the extra taste from the remnants of wax.

Leaving the morsels unfinished, he returned to the windows with the screwdriver and began tuning—one twist to top, one twist to bottom and pluck and listen. Little by little, Bass *E*. Up a tone, little by little and Treble *E*. To *A*, to *D*, a tone apart; *G* to *B*, an octave span, *B* to top *E* the same. He was less than satisfied overall because even the give of the wood in the frames robbed the chords of accuracy. Perhaps he sought too much, perhaps his ears were only accustomed to perfection.

He ran his hand across the width of the window. The effect was mellifluous and melodic. His throat knotted and his eyes stung.

The second window. As good and easy as the first.

The third needed more time and he knew chill fear as the sun began its downward arc. The fourth came right as simply as the first two. The fifth had woodworm in the frame and try as he might, Jacob could only achieve a bass sound from his treble strings and a dry, dead, rope twang from the bass.

He moved on, aware that he had wasted too much time. Sixth, seventh and eighth windows performed admirably. On the ninth, three feverish screws had been forced in against the thread and refused to budge. The whole was a mess because they broke up the chord.

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Tenth—and Jacob was doubled over with the pain in his wrists. He cursed arthritis, cursed the waning wax, screamed at his own madness—and came up with a bridge as clear and true as the best he had ever fingered. Hearing it thus, he whispered, "I love you—" to the faithful catgut and blessed the numbness that had been an anesthetic to his tattered hands.

His blood on the guitar strings at every window. His stain on every note they played, ever.

There had been no hint or whisper of Asa Clements all day, but he knew the boy was out there biding his time and conserving his footage.

"Tonight," he shouted at the darkening garden. "Bring your friends tonight."

Then he sat down to wait for a breeze.

And the world goes on burning just the same,
So I guess I'm going to have to take the blame.
No, there's no other hand out for a share.
I'm the man who bored the world too stiff to care.

THE NIGHT grew jagged with noise and the earphone men were screaming with the pain and the vibe counters were running off the dial and Gianni Intermezzo was taking Asa Clements by the scruff of the neck and hurling him into the presence of Jacob Grass.

The old man was sitting in his upright chair with the Gallacher across his knees and his shoulders hunched against the open-window cold.

In the darkness Clements could not see the tears along the lines of Jacob's cheeks and Grass wasn't about to tell of his grief when the wind had sprung up and rendered his Aeolian strings shrill and unmelodic, tortured and meaningless.

Besides, the camera fiend was still smarting from Intermezzo's invective. Boiled down to the functional, what he had said was: "Get in there and save this production."

Clements knew exactly what was meant by that and had come with Minolta at the ready. Now here was Grass sitting in his chair, not moving, not even going crazy or threshing about.

"What do you want me to do?" The old man asked as loudly as he could against the keening wire hum.

"What?"

"How do you want me to end it? Am I all right here? I can't move very far or very fast now."

"Don't. Not yet." Desperation had removed any subtlety from the Clements approach.

"I mean, that is what you want, isn't it?"

"No."

The chandelier burst apart in a crystal blizzard, showering the pair of them. Clements, unhurt as he stood, brushed splinters from his

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hair and opened a cut in his left palm. He sucked at it because this gave him something to do but no words came with the salt taste.

"Why don't you admit it?" prodded Grass. "Come on, now that truth is inevitable, let me hear you say it. Let me go with you being honest."

"Please, Jacob—" And the words were gone again. A dilemma without articulation. How do you say, *You're not dying the way I want you to?*

"Then guide me." Grass could read the pause.

"Jacob, this noise. It's tearing me apart—"

Something fell in an upper room. Something slid on the Camelot slopes of the roof.

"Say it, Asa. Say you wanted me dead."

"What does it matter?"

"It matters to me what the last man I'll ever speak to is thinking."

"You're neurotic, Jacob. I came to promote your music, to give you a new chance."

"And how do you like my handmade synthesizer?"

"Fantastic. Only it's ruined everything."

"Why?"

"Good grief, man, we can't record the event in this—this bedlam. All our sound instruments are going haywire—"

Clements could not be sure, but he fancied that Jacob Grass chuckled. There was too much volume. The feel of it was coming right up through the floor, climbing his legs, jetting up his backbone, socking at his brain. "Why yourself?" he screamed. "Why go to all this trouble?"

On the upper landing a mirror was shaken loose and disintegrated before touching the floor.

Pinpricks sabotaged Clements' eardrums so that he had to struggle to hear Jacob's reply.

"I thought you were used to dealing with professionals."

"I am, but what has that—"

"Then you should know."

Wire-cutters. The simple answer. Short work at the windows. The peacemaker. Relief swathed Asa Clements like cotton wool.

"I don't know," he said. "Tell me."

"A true artist never goes on stage without an encore ready."

Clements was running for the door.

Jacob set his fingers like a caress on the neck of his Gallacher, closed his eyes and finished his lifesong without fuss or film coverage.

Clements, back with the tools and racing from window to window, didn't even look at the crumbled Hollywood man.

Gianni Intermezzo's backup cameraman got some fine telescopic shots of panic and wire-cutters before the Hollywood mansion crumbled upon Asa Clements.

"That's integrity," said Mr. Intermezzo to the silent night. ★

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INVERTED WORLD

Part III

CHRISTOPHER PRIEST

WHAT HAS GONE BEFORE

Helward Mann *of Earth City has reached manhood at the age of six hundred and fifty miles. His age is reckoned by the city's progress toward the Optimum—e.g. from the moment of* Helward's *birth Earth City has traveled six hundred and fifty miles toward this elusive goal, a process of which* Helward *knows little or nothing. His early years, spent in the creche with other city*

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children, have been sheltered. His education has been Earth oriented and has given him little information about the planet the city now traverses.

Following elaborate rites welcoming him to adulthood—at which Helward elects to become an apprentice of the Future Surveyors' Guild and his engagement to a girl named Victoria Lerouex is announced—Helward is permitted to see his first sunrise, actually his first glimpse of the outside. Assigned to serve his initial term as an apprentice with the Trackmen's Guild, he discovers that the city moves forward across the planet's surface on rails painstakingly laid ahead of it and as painstakingly removed once they have served their purpose (a) to prevent the city's sliding backward and (b) to be reused. He also learns that th city is fusion-powered and is the sole source of the good life on the planet—it alone has adequate (if tasteless and synthetic) food, clothing, medical and educational facilities. It uses these to barter for workers and women to bear children—of which it has a shortage—from among primitive tribes of aliens or "tooks" en route. The women acquired by barter remain in the city long enough to bear a child to a city male, are then returned to their tribes.

The knowledge of how the city came to be is lost. It is, however, known that somehow it originated on Earth and that, in order to survive, it must be winched constantly toward the Optimum, which moves ahead of it. Instructions to this effect are contained in a document known as Destain's Directive, handed down from the city's founder in some dim antiquity.

Ideally the city should progress at the rate of one-tenth of a mile a day. This pace, however, is never maintained—there is uneven terrain to contend with; rivers and gorges must be bridged. The city has never been closer than three miles to the Optimum. This, however, is enough to keep it alive and functioning.

There is discontent both within and outside the city. Helward experiences both. Victoria, whom he has married, finds her life in urban confinement pointless. Helward has taken an apprentice's oath never to discuss the outside or the city's relationship to it with the uninitiated under penalty of death. To save his marriage, however, he breaks his vow in conversations with Victoria. He also is involved and injured in a riot of resentful "took" workers.

After serving his apprenticeship Helward is sent south—into the city's "past"—to escort home three local women for whose child-bearing services the city has bartered to alleviate its woman-shortage. He discovers that the landscape that should have been familiar to him from the city's passage has subtly altered—a ravine the city had bridged with great difficulty has shrunk to a mere ditch; mountains have lost height. The terrain has flattened out and the tracks of the city's passing have spread out.

The three women with him also seem to grow shorter and broader

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until they split their dresses and must proceed naked. He himself remains physically unchanged—but discovers himself experiencing a strange force pulling him southward . . .

XVIII

SHORTLY before they moved on Rosario tried to speak to him. He had difficulty understanding her. Her accent was strong in any case, and now her voice was pitched high and she spoke too quickly.

After many attempts he got the gist of what she was saying.

She and the other girls were afraid to return to their village. They were of the city now and would be rejected by their own kind.

Helward said they must go on, as had been their choice, but Rosario said they would not move. She was married to a man in her village and, although at first she had wanted to return to him, she thought now he would kill her. Lucia, too, was married and shared the fear. The people of the villages hated the city and for their involvement with it the girls would be punished.

Helward gave up trying to answer Rosario. He was having as much difficulty making her understand as he had in comprehending her. After all, the girls had entered the city willingly in the first place as part of the barter. He tried to say so, but she could not understand.

Even while they had been talking the process of change had continued. She was now a little more than twelve inches high and her body was nearly five feet wide. It was impossible to recognize her or the other girls as human, even though he knew they were.

He said, "Wait here."

He stood up and fell again, rolling across the ground. The force on his body was now much greater and he stopped himself with great difficulty. He crawled back against the force to his pack and pulled it on. He found the rope and slung it over his shoulder.

Bracing himself against the pressure, he walked south.

IT WAS no longer possible to make out any natural features other than the line of rising ground ahead. The surface on which he walked was now an indistinct blur and although he stopped to examine it from time to time he could distinguish nothing on it that might once have been grass, rocks or soil.

The natural features of the world were distorting—they were spreading laterally to east and west, diminishing in height and depth.

A boulder here might be a strip of dark gray, one hundredth of an inch wide and two hundred yards long. The low, snow-capped ridge ahead might be mountains—that long strip of green a tree.

That narrow strip of off-white, a naked woman.

HE REACHED the higher ground more quickly than he had anticipated. The pull toward the south was intensifying and when Helward was less than fifty yards from the nearest hill he stumbled—

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and was rolling with an ever-increasing speed toward it.

The northern face was almost vertical, like the leeward side of a wind-blown dune, and he collided hard with it. Almost at once the southward pressure was pulling him up the face, defying gravity. In desperation, for he knew if he reached the top the pressure on him could never be resisted, he scrambled for a hold on the rock-hard face. It came in the form of an outjutting spur. Helward grabbed it with both hands, desperately holding himself back against the relentless pressure. His body swung around until he was lying vertically against the wall, feet above his head, knowing that if he slipped now he would be taken backward up the slope and on down toward the south.

He reached behind into his pack and found the grapple. He lodged it firmly under the spur, attached the rope to it and wound the other end around his wrist.

The southward pressure was now so great upon him that the normal downward pull of gravity was virtually negated.

THE substance of the mountain was changing beneath him. The hard, almost vertical wall was slowly widening to east and west and flattening, so that behind him the summit of the ridge appeared to be creeping down toward him. He saw a cleft in the rock beside him gradually closing and removed the grapple from under the spur and thrust it into the cleft. Moments later the grapple was securely held.

THE summit of the ridge had now distended and was beneath his body. The southward pressure took him and he was swept over the ridge. The rope held and he was suspended horizontally.

What had been the mountain became a hard protuberance beneath his chest. His stomach lay in what had been the valley beyond. His feet scrambled for a hold against the diminishing ridge of what had once been another mountain.

He was flat along the surface of the world, a giant recumbent across an erstwhile mountain region.

HE RAISED his body, trying to ease his position. Lifting his head, he suddenly found he was short of breath. A hard, icy wind blew from the north, but it was thin and short of oxygen. He lowered his head again, resting his chin on the ground. At this level his nose could take air that would sustain him.

It was bitterly cold.

There were clouds and borne on the wind they skimmed a few inches above the ground like a white unbroken sheet. They surged around his face, flowing around his nose like foam at the bow of a ship.

His mouth was below them—his eyes were above.

Helward looked ahead of him through the thin, rarefied atmosphere above the clouds. He looked to the north.

He was at the edge of the world—its bulk lay before him.

He could see the whole world.

North of him the terrain was level, flat as the top of a table. But

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at the center, due north of him, the ground rose from that flatness in a perfectly symmetrical, rising and curving concave spire. It narrowed and narrowed, reaching up, growing ever more slender, rising so high that it was impossible to see where it ended.

He saw it in a multitude of colors. There were broad areas of brown and yellow, patched with green. Farther north lay a blueness—pure sapphire, bright on the eyes. Over it all, the white of clouds in long, tenuous whorls, in brilliant swarms, in flaky patterns.

The sun was setting. Red to the northeast, it glowed against the impossible horizon.

The shape of it was the same. A broad flat disk that might be an equator. At its center and to north and south its poles existed as rising, concave spires.

Helward had seen the sun so often that he no longer questioned its appearance. But now he knew that the world, too, was that shape.

XIX

THE sun set and the world became dark.

The southward pressure was now so great that his body hardly touched what had once been the mountains beneath him. He was hanging on the rope in the darkness, as if vertically against the wall of a cliff—reason told him that he was still horizontal, but reason was in conflict with sensation.

He could no longer trust the strength of the rope. Helward reached forward, curled his fingertips around two small extrusions (had they once been mountains?) and hauled himself forward.

The surface beyond was smoother and he could hardly find a firm hold. With trouble he discovered he could dig his fingers into the ground sufficiently to obtain a temporary purchase. He dragged himself forward again—a matter of inches, but in another sense a matter of miles. The southward pressure did not perceptibly diminish.

HE ABANDONED his rope and crawled forward by hand. Another few inches and his feet came into contact with the low ridge that had been the mountain. He pressed hard, moved forward again.

Gradually the pressure on him began to decrease until it was no longer a matter of desperation to hold on. Helward relaxed for a moment, trying to catch his breath. Even as he did so he felt sure that the pressure was increasing again, so he moved forward. Soon he had gone so far that he could rest on his hands and knees.

He had not looked south. What had been behind him?

HE CRAWLED a long way before he felt able to stand. He did so, leaning northward to counteract the force. He walked forward, feeling the inexplicable drag steadily diminish. He soon felt he was sufficiently far from the worst zone of pressure to sit on the ground and take a proper rest.

He looked to the south. All was darkness. The clouds which had

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broken around his face were now some height above him. They occluded the moon, which Helward, in his untutored way, had never questioned. It too was that strange shape—he had seen it many times and had always accepted it.

He continued walking north, feeling the immense drag weakening. The landscape around him was dark and featureless and he paid no attention to it. Only one thought dominated his mind—before he rested he must move sufficiently far not to be dragged back again to that zone of pressure. He knew now a basic truth of this world—the ground was indeed moving as Collings had said. Up north, where the city existed, the ground moved with an almost imperceptible slowness: about one mile in a period of ten days. But farther south it moved faster and its acceleration was exponential. He had seen it in the way the bodies of the girls had changed: in the space of one night the ground had moved sufficiently far for their bodies to be affected by the lateral distortions to which they—and not he—were subjected.

The city could not rest. It was destined to move forever, because if it halted it would start the long slow movement down here—down past—where it would come eventually to the zone where mountains became ridges a few inches high, where an irresistible pressure would sweep it to its destruction.

At that moment, as he walked slowly northward across the strange, dark terrain, he could give no rationale to what he had experienced. Everything conflicted with logic. Ground was stable—it could not move. Mountains did not distort. Human beings did not become twelve inches high. Chasms did not narrow. Babies did not choke on their mothers' milk.

THOUGH the night was well advanced, Helward felt no tiredness beyond the residue of the physical strain he had endured on the side of the mountain. It occurred to him that the day had passed quickly; faster than he could have credited.

He was well beyond the zone of maximum pressure now, but he was still too aware of it to halt. It was not a pleasant thought to sleep while the ground moved beneath him, bearing him ineluctably south.

He was a microcosm of the city. He could no more rest than it.

FATIGUE seized him at last and he sprawled on the hard ground and slept.

He was awakened by the sunrise and his first thought was of the southward pressure. Alarmed, he sprang to his feet and tested his balance—the force was there, but not measurably worse than it had been at his last recollection.

He looked along his backtrail.

There, incredibly, the mountains stood.

It could not be so. He had seen them, *felt* them reduce to a ridge of hard ground, no more than an inch or two in height. Yet they were clearly there: steep, irregularly shaped, capped with snow.

Helward found his pack and checked its contents. He had lost

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the rope and grapple and much of his equipment had been with the girls when he left them, but he still had a canteen of water, a sleeping bag and several packets of the dehydrated food. These would keep him going for a while.

He ate a little of the food, then strapped his pack in place.

He glanced up at the sun, determined this time to keep his bearings.

He walked south toward the mountains.

The pressure grew about him slowly, dragging him forward. As he watched the mountains they seemed to shrink in height. The substance of the soil under his feet became thicker and the terrain once more began to feature fused lateral streaks.

Overhead, the sun moved faster than it had any right to do.

Fighting against the pressure, Helward stopped when he saw that the mountains were once again not much more than an undulating line of low hills.

He was not equipped to go farther. He turned and moved north. Night fell an hour later.

HE WALKED on through the darkness until he felt the pressure was acceptably low, then rested.

When daylight came again the mountains were clearly in view—and as mountains.

He waited. As the day advanced the pressure grew. He was being carried toward the mountains by the motion of the ground—and as he watched and waited he saw them slowly spread laterally.

He moved his camp north before night fell. He had seen enough. It was time to return to the city. A new thought worried him. Would he have to make some kind of report on what had happened?

He felt incapable of absorbing much of what he had seen into his own experience—how could he describe it to someone else?

A focal point had been his stupefying view of the world spread before him. Had any man ever been privy to such an experience? How could the mind encompass a concept which the eye had been incapable of translating into reasonable visual frames of reference? To his left and right—and, for all he knew, to the south of him—the surface of the world had extended seemingly without bound. Only in the north, due north, had he found a definition of form: that curving, rising pinnacle of land stretching to no visible end.

The three girls—how could he report on his having returned them safely to their home grounds when they had passed into a state in which he could not communicate with them or even see them? They had passed on into their own world, utterly alien to him.

The baby: what had happened to it? Manifestly of the city, for it had not been affected by the distortions of the past, presumably it had been abandoned by Rosario—and was now presumably dead. Even if it still lived, the motion of the ground would bear it south to that zone of pressure where it could not survive.

Lost in such thoughts, Helward

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walked on, taking little account of his surroundings. Only when he stopped to take a drink of water did he look about—and with a start of surprise realize that he recognized the terrain.

This was the rocky land to the north of the chasm where the bridge had been built.

He took a few mouthfuls of the water, then retraced his steps. If he were to find his way back to the city he must relocate the tracks, and the site of the bridge would be a better landmark than most.

He encountered a stream which, in his preoccupied state, he must have crossed without noticing. He followed its course, wondering if this could possibly be the same stream, for it appeared to be a tiny rivulet. In due time the banks of the stream became steeper and rougher, but there was no sign of the chasm.

Helward scrambled up the bank and walked back against the direction of the water-flow. Though naggingly familiar, the appearance of the stream was distended and distorted, until he felt it could be another stream entirely.

Then he noticed a long black oval near the edge of the water. He went down to examine it. He caught a faint smell of burning—and on closer inspection realized this was the scar of a fire. His own old campfire.

The stream at this point was no more than a yard wide—yet, when he had been here with the girls, it had been at least twelve feet across. He climbed again to the top of the bank. After a long search he found some marks on the ground that could have been the traces of one of the suspension towers.

From the top of one bank to the next the distance could have been no more than five or six yards. The drop to the water was a matter of feet.

At this point the city had crossed.

He walked north and in a short while found the trace of a sleeper. It was about seventeen feet long. The one next to it was three inches away.

By the following night the scale of the landscape had assumed proportions that were more familiar to him. Trees looked like trees, not sprawling bushes. Pebbles were round, grass grew in clumps instead of looking like a smear of green. The tracks he followed were still too widely spread to have any resemblance to the gauge used by the city, but Helward thought that his journey should not be much longer.

He had lost track of the number of days that had passed, but the terrain was becoming increasingly familiar to him and he knew that so far his time away from the city was still considerably less than that predicted by Clausewitz. Even taking into account the two or three days that had seemed to go so quickly while he was in the zone of pressure, the city could not have moved more than a mile or two farther to the north during his absence.

This thought encouraged him, for his supplies of food and water were dwindling.

He walked on and the days

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passed. There was still no sign of the city and the tracks showed no signs of narrowing to their more normal gauge. By now he was so accustomed to the notion of the lateral distortion of this world in the south, that he took the evidence of it in stride.

One morning he was disturbed by a new thought. For several days the gauge of the tracks had not appeared to change—could it be that he had encountered a region where the motion of the ground was directly equal to the speed of his own walking? Was he like a mouse on a treadmill, making no forward progress?

For an hour or two he hastened his walk, but soon reason prevailed. He had, after all, successfully moved away from the zone of pressure where the southward motion was greater. But more days passed and the city seemed to be no nearer. Soon he was down to his last two packets of food and twice he had had to supplement his water supplies from local sources.

The day he reached the end of his food he was suddenly taken by a surge of excitement. Potential starvation was no longer a problem—he had recognized where he was! This was the region he had been riding through with Barter Collings—at that time, two or three miles north of optimum!

By his estimate of time he had been gone for three miles at the most—so the city should be in sight.

Up ahead, the line of track-scars continued until they reached a low ridge—and no sign of the city. The sleeper pits were still distorted and the next row of scars—the left inner—was some distance away.

All it could mean, Helward reasoned, was that while he had been away the city had somehow moved much faster. Perhaps it had even overtaken the optimum and was in a region where the ground moved more slowly. Already he was beginning to understand why the city moved on: perhaps ahead of optimum there was a zone where the ground did not move at all.

In which case the city could stop—the grand treadmill would end.

XX

HELWARD passed a hungry night and slept badly. In the morning he took a few mouthfuls of water and was soon on his way. The city had to come into view soon.

He was forced to rest during the hottest part of the day. The countryside, barren and open, afforded little shade. He sat down beside the track.

Staring bleakly ahead, he saw something that gave him fresh hope—three people were walking slowly down the track toward him. They must be from the city, sent out to find him. He waited for them to reach him.

As they approached he tried to stand, but stumbled. He lay still.

"Are you from the city?"

Helward opened his eyes and looked up at the speaker. He saw a young man, dressed in a guild-apprentice uniform. He nodded, his jaw slack.

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"You're ill—what's the matter?"

"I'm okay. Have you any food?"

"Drink this."

A canteen of water was offered and Helward took a mouthful. The water was stale and flat—city water.

"Can you stand?"

With assistance, Helward rose to his feet and walked away from the track to where a few scrawny bushes grew. Helward sat down on the ground and the young man opened his pack. With a start of recognition, Helward realized the pack was identical to his own.

"Do I know you?" he asked.

"Apprentice Kellen Li-Chen."

Li-Chen! He remembered him from the creche. "I'm Helward Mann."

Kellen Li-Chen opened a packet of dehydrated food and insinuated some water. Soon a familiar portion of gray porridge was before him, and Helward began to eat it.

In the background, some yards away, two girls stood and waited.

"You're going down past," he said between mouthfuls.

"Yes."

"I've just been."

"What's there?"

Suddenly, Helward remembered meeting Torrold Pelham under almost identical circumstances.

"You're down past now," he said. "Can't you feel it?"

Kellen shook his head.

"What do you mean?" he said.

Helward meant the southward pressure, the subtle pull of which he could still feel as he walked. But he understood now that Kellen had probably not yet noticed it. Until it had been experienced in its extremeness, it would not be recognized as a separate sensation.

"It's impossible to talk about it," Helward said. "Go down past and you'll see for yourself." He glanced at the girls. They were sitting on the ground, their backs turned quite deliberately on the men. He couldn't help smiling to himself. "Kellen—how far is the city from here?"

"A few miles back. About five."

Five miles! Then by now it must have easily overtaken the optimum.

"Can you give me some food? Just a little—enough to get me back to the city."

"Of course."

Kellen took four packets and handed them over. Helward looked at them for a moment, then handed three of them back.

"One will be enough. You'll need the rest."

"I haven't got far to go," said Kellen.

"I know—but you'll still need them." He looked again at the other apprentice. "How long have you been out of the creche, Kellen?"

"About fifteen miles."

But Kellen was much younger than he. He remembered distinctly that Kellen had been two grades below him in the creche. The city must be recruiting apprentices much earlier now. But Kellen looked mature and well-filled. His body was not that of an adolescent.

"How old are you?" he said.

"Six hundred and sixty-five."

That couldn't be so—he was at least fifty miles younger than Helward, who was by his own reckon-

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ing six hundred and seventy.

"Have you been working on the tracks?"

"Yes. Bloody hard work."

"I know. How has the city been able to move so fast?"

"Fast? It's been a bad period. We had a river to cross and at the moment the city is held up by hilly country. We've lost a lot of ground. When I left it was six miles behind optimum."

"Six miles? Then the optimum's moved faster?"

"Not as far as I know." Kellen was looking over his shoulder at the girls. "I think I'd better be moving on now. Are you all right?"

"Yes. How are you getting on with them?"

Kellen grinned.

"Not bad," he said. "Language barriers, but I think I can find a bit of common vocabulary."

Helward laughed and again remembered Pelham.

"Make it soon," he said. "It gets difficult later."

Kellen Li-Chen stared at him for a moment, then stood up.

"The sooner the better, I think," he said. He went back to the girls, who complained loudly when they realized their break had been only a short one. As they walked past him, Helward saw that one of the girls had unbuttoned her shirt all down the front and had tied it with a knot.

With the food Kellen had given him, Helward felt certain of reaching the city without any further problems. After the distance he had traveled another five miles was as nothing and he anticipated reaching the city by nightfall. The countryside around him was now entirely new to him: in spite of what Kellen had said it certainly seemed that the city had made good progress during his absence.

Evening approached and still he saw no sign of the city.

The only hopeful indication was that now the scars left by the sleepers were of more normal dimensions—the next time Helward stopped for water he measured the nearest pit and estimated that it was about six feet long.

Ahead of him was rising ground and he could see a ridge over which the track remains ran. He felt sure the city must be lying in the hollow beyond and so he pressed on, hoping for a sight of it before nightfall.

The sun was touching the horizon as he reached the ridge and looked down into the valley.

A broad river flowed across the valley floor. The track scars reached the southern bank and continued on the other side. As far as he could see they ran across the valley until lost to sight in some woodland. There was no sign of the city.

Angry and confused, Helward stared at the valley until darkness fell, then made his camp for the night.

He started out soon after daybreak and within a few minutes was by the bank of the river. On this side there were many signs of human activity—the ground at the water's edge had been churned into a muddy waste and a great deal of discarded timber and broken

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sleeper-foundations lay about. In the water itself were several timber piles, presumably all that now remained of the bridge the city had had to build.

Helward waded down into the water, holding on to the nearest pile for support. As the water deepened he started to swim, but the current took him and he was swept a long way downstream before he could haul himself onto the northern bank.

Soaked through, he walked back upstream until he reached the track remains. His pack and clothes weighed heavily on him, so he undressed and laid his clothes in the sun, then spread the sleeping bag and canvas pack. An hour later his clothes were dry, so he pulled them on again and prepared to move off. The sleeping bag was still not completely dry, but he planned to air it at his next stop.

He was strapping his pack into place when he heard a rattling noise and something plucked at his shoulder. Helward turned in time to see a crossbow quarrel fall on the ground.

He dove for cover into one of the sleeper foundations.

"Stay right there."

He looked in the direction of the voice. He couldn't see the speaker, but there was a clump of bushes some fifty yards away.

Helward examined his shoulder. The quarrel had torn away a section of his sleeve, but it had not drawn blood. He was defenseless, having lost his crossbow with the remainder of his possessions.

"I'm coming out—don't move."

A moment later a man wearing the guild-apprentice uniform stepped out from behind the bush, his crossbow leveled at Helward.

Helward shouted: "Don't shoot—I'm from the city."

The man said nothing, but continued to advance. He halted about five yards away.

"All right—stand up."

Helward did so, seeking the recognition he anticipated.

"Who are you?"

"I'm from the city," Helward repeated.

"Which guild?"

"The Futures."

"What's the last line of the oath?"

Helward shook his head in surprise. "Listen, what the—"

"Come on—the oath."

"'All this is sworn in the full knowledge that a betrayal of any one—'"

The man lowered his bow.

"Okay," he said. "I had to be sure. What's your name?"

"Helward Mann."

The other looked at him closely. "God, I never recognized you! You've grown a beard—"

"Jase!"

The two young men stared at each other for a few seconds more, then greeted each other affably. Helward realized that they both must have changed out of recognition in the time since they had last met. Then they had both been beardless boys, agonizing about the frustrations of life inside the creche—now they had changed in outlook as well as appearance. In

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the creche, Gelman Jase had affected a worldliness and disdain for the order by which they had to exist and he had mannered himself as a careless and irresponsible leader of the boys who "matured" less quickly. None of this was apparent to Helward as they stood there beside the river, renewing their earlier friendship. His experiences outside the city had weathered Jase subjectively, just as they had weathered his appearance.

"What was all that about, shooting at me?" Helward asked.

"I thought you were a took."

"A what? Oh yes." He had forgotten the slang word. "But didn't you see my uniform?"

"Doesn't mean anything any more."

"But—"

"Listen, Helward, things are changing. How many apprentices have you seen down past?"

"Two. Three, including you."

"Right. Did you know the city sends an apprentice down past every mile or so? There should be many more down here—and since we all take the same route we ought to be meeting each other almost every day. But the tooks are catching on. They're killing the apprentices and taking their uniforms. Were you attacked?"

"No," said Helward.

"I was."

"You could have tried to identify me before you shot at me."

"I aimed to miss you."

Helward indicated his torn sleeve. "Then you're just a lousy shot."

Jase moved over to where his quarrel had fallen. He picked it up, examined it for damage, then replaced it in its pouch.

"We ought to be trying to reach the city," he said when he returned.

"Do you know where it is?"

Jase looked worried.

"I can't work it out," he said. "I've been walking for miles. Has the city suddenly accelerated?"

"Not as far as I know. I saw another apprentice yesterday. He said the city had actually been delayed."

"Then where the hell is it?"

"Somewhere up there." Helward indicated the track remains leading north.

"Then we go on."

By the end of the day they still had not sighted the city, though the tracks were now apparently the normal dimensions. They made a camp in a patch of woodland through which a stream of clean water flowed.

Jase was far better equipped than Helward. In addition to his crossbow, he had a spare sleeping bag (Helward's wet one had started to smell and he threw it away), a tent and plenty of food.

"What do you make of down past?" Jase asked.

"I'm still trying to understand it," said Helward. "What about you?"

"I don't know. The same, I suppose. I can't make logic of what I've seen—and yet I know I've seen and experienced it."

"How can ground possibly move?"

"You noticed it too?"

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"I think so. That's what happened, wasn't it?"

Later, they traded accounts of what had happened to them. Some of Jase's experiences had been remarkably different from Helward's.

He had left the creche a few miles before Helward and had undergone many of the same experiences working outside the city. An essential difference, though, was that he had not married, and had been invited to meet some of the transferred women. As a result of this he had already known the two women he had been assigned to escort down past.

He had learned many of the stories told by the local inhabitants about the people of the city. How the city was populated by giants, how they plundered and killed and raped the women.

As his journey south had proceeded Jase had realized that the girls had been growing more frightened. When he had asked them why, they had said that they felt certain they would be killed by their own kind when they returned. They had wanted to go back to the city. At this point Jase had been noticing the first effects of the lateral distortions. He had turned the girls back and told them to make their own way back to the city, intending to spend one more day on his own down past in order to study the phenomenon.

He had traveled south, but had seen little that interested him. Then he had attempted to find the girls. He had discovered them three days later. Their throats had been cut. Still recoiling from the shock, Jase himself had been attacked by a crowd of local men, some of whom were wearing apprentices' uniforms. He had managed to escape, but the men had given chase. Three days of nightmare had followed. While making his escape he had fallen and badly twisted his foot and in his lamed state had been able to do little more than hide. During the chase, he had gone a long way from the tracks and had moved south by several miles. The hunt had been called off. Jase had stayed in hiding—but gradually had felt a slow build-up of southward pressure. He had realized that he was in a region he could not recognize. He described to Helward the flat, featureless terrain, the tremendous pressure, the way in which physical distortions took place.

He had tried to move back in the direction of the tracks, but his weakened leg had made progress difficult. Finally he had been forced to anchor himself to the ground with the grapple and rope until he could walk again. The build-up of pressure had continued and, fearing the rope would hold no longer, he had been forced to crawl northward. After a long and difficult period he had managed to escape from the zone of worst pressure and had headed back toward the city.

He had wandered for a long time without finding the tracks. As a consequence his knowledge of the terrain away from the immediate neighborhood of the tracks was considerably greater than Helward's.

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"DID YOU know there's another city over there?" Jase asked, indicating the land to the west of the tracks.

"Another city?" Helward was incredulous.

"Nothing like Earth. This one is built on the ground."

"But how—"

"It's immense. Ten times, twenty times as big as Earth. I didn't recognize it for what it was at first—I thought it was just another settlement, but one much larger than what we've seen before. Helward, listen, it's a city like the cities we learned about in the creche—the ones on Earth planet. Hundreds, thousands of buildings—all built on the ground."

"Are there any people there?"

"A few—not many. There was a lot of damage. I don't know what happened there, but most of it seemed to be abandoned now. I didn't stay long because I didn't want to be seen. But it's a beautiful sight—all those buildings."

"Can we go there?"

"No. Keep away. Too many tooks. There's something going on out there—the situation is changing. They're organizing themselves better and have improved lines of communication. In the past, when the city went to a village we were often the first people from outside whom the inhabitants had seen for a long time. But from things the girls said to me I got the impression that that's not likely to be the case any more. Word is spreading about the city—and the tooks don't like us. They never have, but in small groups they were weak. Now I think they want to destroy the city."

"And so they dress as apprentices," said Helward, still not grasping the seriousness of Jase's tone.

"That's a small part of it. They take the clothes of the apprentices they kill to make further killings easier. But if they decide to attack the city it'll be when they're well organized and determined."

"I can't believe that they could ever threaten us."

"Maybe not. But you were lucky."

IN THE morning they set out early and traveled hard. They walked all day, not stopping for more than a few minutes at a time. By their side, the scars left by the tracks had returned to normal dimensions and both were spurred on by the thought that the city could not be more than a few hours' walk ahead.

As the afternoon drew on the track led in a winding route around the side of a hill, and as they reached the crest of the climb they saw the city ahead of them, stationary in a broad valley.

They stopped, stared.

The city had changed.

Something about it made Helward run forward. He could see signs of normal activity about the city. Four track crews were tearing up the rails behind it. Ahead of it a larger team was sinking piles into the river that presently barred the city's way. But the shape of the city had changed. The rear section was misshapen and blackened.

The lines of militia had been

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strengthened. Jase and Helward were halted and their identities checked. Both men fumed at the delay, for it was clear that a major disaster had struck here. While waiting for clearance from inside the city, Jase learned from the militiaman in charge that there had been two attacks by the tooks. The second one had been more serious than the first. At least twenty-three militiamen had been killed—they were still counting bodies.

When the clearance came through, Helward and Jase walked on in silence.

The creche had been razed—mostly it was the children who had died.

More had changed. The impact of these changes was severe, but Helward had no time to register any reaction. He could only mark them, then try to push them aside until external pressures eased. He had no time to dwell on his thoughts.

He learned that his father had died. The angina had stopped his heart only a few hours ater Helward had left the city. Clausewitz broke the news to him—and Clausewitz also told Helward that his apprenticeship was now over.

More: Victoria had given birth to a baby—a boy—but it had been one of those that had died in the last attack.

More: Victoria had signed a form that pronounced the marriage over. She was living with another man and was pregnant again.

And more, implicitly tied up with all of these events, yet no more conceivable: Helward learned from the central calendar that while he had been away the city had moved a total of seventy-three miles and was even so eight miles behind optimum. In his own subjective time scale, Helward had been gone for less than three miles.

He accepted all these as facts. The reaction of shock could come later—meanwhile another attack was imminent.

BOOK THREE

XXI

The valley was dark and silent. Across on the northern side of the river I saw a red light flash on twice, then nothing.

Seconds later I heard from deep within the city the grinding of the winch drums and the city began to inch forward. The sound echoed around the valley.

I was lying with about thirty other men in the tangled undergrowth that spread across the face of the hill. I had been drafted temporarily to work with the militia during this most critical of all the city's crossings. The third attack was anticipated at any moment. It had been judged that once the city could reach the northern bank of the river it would, by nature of the surrounding terrain, be able to defend itself sufficiently long for the tracks to be extended at least as far as the highest point of the pass through the hills to the north. Once there, it was thought that it could

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again defend itself for the next phase of track-laying.

Somewhere in the valley, we knew, were about a hundred and fifty tooks, all armed with rifles. They presented a formidable enemy. The city had only twelve rifles taken from the tooks and the ammunition for them had been spent during the second attack. Our only realistic weapons were the crosbows—at short range, deadly—and an awareness of the value of intelligence work. This latter had enabled us to prepare the counter-attack of which I was a part.

A few hours earlier, as darkness fell, we had taken up this position overlooking the valley. The main force of defense was made up of three ranks of crossbowmen deployed around the city itself. They would retreat as the city started out across the bridge until they formed a defensive position around the tracks. The tooks would concentrate their fire on these men and at that moment we could spring our ambush.

With fortune on our side, the counterattack would not be necessary. The bridge-building work had been completed faster than anticipated and it was hoped that the city would be safely across to the other side under cover of darkness before the tooks realized.

But in the still of the valley the sound of the winches was unmistakable.

The forward edge of the city had just reached the bridge itself when the first shots were heard. I placed a bolt in the bow and held my hand over the safety catch.

It was a cloudy night and visibility was poor. I had seen the flashes from the rifles and estimated that the tooks were ranged in a rough semicircle, approximately one hundred yards from our men. I could not tell if any of their bullets had hit, but so far there were no answering shots.

More rifles fired and we could tell the tooks were closing in. The city had half its bulk on the bridge—and still crept forward.

From down below came a distant shout: "Lights!"

Instantly a battery of eight arc-lamps situated on the rear of the city came on, directed over the heads of the crossbowmen and into the surrounding terrain. The tooks were there, not taking any kind of cover.

The first rank of crossbowmen loosed their bolts, hunched down and started to reload. The second rank shot, hunched down and reloaded. The third rank shot, reloaded.

Taken by surprise the tooks had suffered several casualties, but now they threw themselves down against the ground and fired at all they could see of the defenders: the black silhouettes against the arc-lamps.

"Lights off!"

Darkness fell at once and the crossbowmen by the city dispersed. A few seconds later the lights came on again and the crossbowmen fired from their new positions.

Once again the tooks were taken off aim and more casualties were inflicted. The lights went off again and in the sudden darkness the

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crossbowmen returned to their former position. The maneuver was repeated.

At a shout from below the arc-lamps came on again and we saw that the tooks were charging. The city was now on the bridge.

Suddenly there was a loud explosion and a gush of flame licked the side of the city. An instant later a second explosion occurred on the bridge itself and flames spread across the dry timber of the trestle.

"Reserve force, ready!"

I stood up and waited for the order. I was no longer frightened and the tension of the waiting hours had disappeared.

"Advance!"

The arc-lamps were still burning and we could see the tooks clearly. Most of them were engaged in a hand-to-hand battle with the main defense, but several more were crouched on the ground, taking careful aim at the superstructure of the city. Two of the arc-lamps were hit and went out.

The flames on the bridge and against the side of the city were spreading.

I saw a took near the bank of the river, swinging his arm back in preparation to throw a metal cylinder. I was no more than twenty yards from him. I aimed, released the bolt—and hit the man in his chest. The incendiary bomb fell a few yards away from him and exploded in a burst of heat and flame.

Our counterattack had, as anticipated, taken the enemy by surprise. We managed to hit three more of the men—but suddenly they broke off and ran toward east, disappearing into the shadows of the valley.

There was considerable confusion for a minute or two. The city was on fire and beneath it the bridge was burning fiercely in two separate places. One concentration of flame was directly beneath the city, but the other was a few yards behind it. It was obviously urgent to deal with the fires, but no one was certain that all the tooks had retreated.

The city continued to winch forward, but where the bridge burned large sections of timber were falling into the river.

Order was restored quickly. A militia officer shouted commands and the men formed into two groups. One group resumed defensive position around the tracks. I joined the second group sent out to the bridge to fight the fire.

After the second attack—in which incendiaries had been used for the first time—firepoints had been fitted to the outside of the city. The nearest of these had been damaged in one of the explosions, and water was gushing away from it uselessly. We found a second one and unraveled the short length of hose.

The intensity of the track fire was too great and it was almost hopeless to try to fight it. Although the city had now passed over the worst of the damage three of the main runner wheels were still to roll over the burning timber—and as we fought in the dense smoke and billowing flames I saw the rail beginning to twist under the combined forces of heat and weight.

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There was a roar and another section of timber fell away. The smoke was too thick. Choking, we had to back out from under the city.

The fire in the superstructure was still blazing, but a fire crew inside the city was attempting to deal with it. The winches turned—the city crept slowly toward the comparative safety of the northern bank.

XXII

In the morning light the damage was assessed. In terms of lost human life the city had not fared too badly. Three militiamen had been killed in the shooting and fifteen had been injured. Inside the city one man had been seriously wounded in one of the incendiary explosions and a dozen more men and women had been overcome by smoke in the ensuing fires.

The physical damage to the city itself was extensive. A whole section of administrative offices had been gutted by the fire and some of the accommodation section was uninhabitable because of fire or water damage.

Beneath the city more was wrong. Although the main base of the city was steel, much of the construction was timber and there were whole sections which had been burned out. The rear runner wheels on the right outer track had been derailed and one of the great wheels had sustained a structural crack. It would have to be discarded—though it could not be replaced.

After the city had reached the northern bank the bridge had continued to burn and was now a total loss. With it had gone several hundred yards of our irreplaceable rails, warped and twisted by the heat.

After two days outside the city, working with the track crews who were salvaging what there was of the rails on the southern bank of the river, I was summoned to see Clausewitz.

Until now I had not reported formally to any of my senior guildsmen. As far as I could determine the normal protocols of the guilds had been abandoned for the duration of the emergency and as I myself could see no end to the serious situation—the attacks had caused inevitable delays and the optimum was ever farther away—I had not expected anyone to call me away from my work outside.

There was a disturbing mood among these men outside. Halfway between despair and desperation, they continued the work of laying the tracks toward the pass. The relaxed energy of my early days outside the city seemed to be a long way behind us. Now the tracks were being built in spite of the situation with the tooks, rather than against an internal need of the city to survive in a strange environment.

The talk among the track crews, the militia, the traction men was all centered in one way or another around the attacks. No longer was there mention of gaining ground on the optimum or of what dangers lay down past. That the city was in a

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crisis was reflected in everyone's attitude.

The change was also apparent inside the city.

Gone was the light, aseptic appearance of the corridors, gone the general atmosphere of workaday routines.

The elevator was no longer working. Many of the main doors in the corridors were locked and at one point an entire wall had been torn away—presumably as an aftermath of one of the fires—so that anyone walking through that part of the city could see what was outside. I remembered Victoria's frustrations of old and reflected that whatever secrecy the guilds might have tried to maintain in the past, such secrecy was no longer possible.

THOUGHT of Victoria pained me—I still did not realize fully what had happened. In what seemed to me to be the passage of a few days she had abandoned all the tacit understandings of the marriage between us and gone to pursue another life without me.

I had not seen her since my return, though I had made sure that she knew I was back in the city. Under the conditions of the external threat it had not been possible to see her anyway, but that aspect of my life was one I needed time to consider before meeting her. The news of her pregnancy by another man—I was told he was an Education administrator named Yung—had not hit me too hard at first, simply because I had just not believed it. Such a situation could not possibly have developed in the time I knew I had been away from her.

I found my way to the first-order guild area with some difficulty. The interior of the city had changed in many ways.

People, noise and dirt seemed to be everywhere. Every spare yard of space had been given over to emergency sleeping room, and even in some of the corridors lay wounded men from outside. Several walls and partitions had been taken down and just outside the first-order quarters—where there had been a series of pleasantly appointed recreation rooms for the guildsmen—an emergency kitchen had been placed.

The smell of burned wood was everywhere.

I knew a fundamental change was coming over the city. I could feel the old structure of the guilds crumbling away. The roles of many people had already changed. Working with the track crews I had met several men for whom it was the first time outside the city, men who—until the attacks—had worked on food synthesis, education or domestic administration. Took labor was now obviously impossible and all hands had to be called to move the city. Why at this moment Clausewitz had summoned me I could not imagine.

There was no sign of him in the Futures' room, so I waited for a while. After half an hour he had still not appeared and knowing my services could be better employed outside, I headed back the way I had come.

I met Future Denton in the corridor.

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"You're Future Mann?"

"Yes."

"We're leaving the city. Are you ready now?"

"I was supposed to be seeing Future Clausewitz."

"That's right. He's sent me instead. Can you ride a horse?"

I had forgotten horses while I had been away from the city. "Yes."

"Good. Meet me at the stables in an hour's time."

He walked on into the Futures' room.

With an hour to spend on my own, I realized that I had nothing to do, no one to see. All my connections with the city were broken—even associative memories of the physical shape and appearance of the city had been disrupted.

I walked down to the rear of the city to see for myself the extent of the damage to the creche, but there was not much to see. Almost the whole superstructure had been burned or demolished and where the children had been housed was merely the bare steel of the main base of the city. From there I could see back across the river to where the attack had taken place. I wondered whether the tooks would try again. I felt they had been well beaten, but I supposed they might eventually reform and attack once more.

It came home to me just how vulnerable the city was. Not designed to repel any kind of attack, it was slow-moving, ungainly, built of highly inflammable materials. All its weakest points, the tracks, the cables, the timber superstructure, were easily accessible.

I wondered if the tooks realized how easy it would be to destroy the city—all they needed to do was disable its motive powers permanently, then sit back and watch as the movement of the ground slowly bore it south.

For the moment, though, the city was relatively secure. Bounded on one side by the river and by rising ground which would afford no cover to any aggressor on the other, it was strategically placed.

I wondered whether I had time to find a change of clothes—I had been working and sleeping in the same ones for many days. This thought inevitably reminded me of Victoria and how she had objected to my uniform after I had been outside the city.

I returned to the Futures' room, and made inquiries. Uniforms were normally available, I was told, but not at the moment. I was told that one would be found while I was away.

Future Denton was waiting for me when I arrived at the stables. I was given a horse and without further delay we rode out from beneath the city and headed north.

XXIII

DENTON was not a man who said much unprompted. He answered any questions I chose to ask, but between us fell long periods of silence. I did not find these uncomfortable—they gave me much needed opportunities to think.

The early training of the guilds

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still ran true: I accepted that I would make what I could of what I saw and not rely on the interpretations of others.

We followed the proposed line of the tracks around the side of the hill and through the pass. There the ground ran steadily down for a long way, following a small watercourse. There was a small patch of woodland at the end of the valley, and then another line of hills.

"Denton, why have we left the city at this moment?" I said. "Surely every man is needed."

"Our work is always important."

"More important than defending the city?"

"Yes."

As we rode he explained that during the last few miles the future surveying had been neglected. This was partly because of the troubles and partly because the guild was undermanned.

"We've mapped as far as these hills," he said. "Those trees—they're a nuisance to the Track guild and they could provide cover for the tooks, but we need more timber. The hills have been surveyed for about another mile, but beyond that it's all virgin territory."

He showed me a chart that had been drawn on a long roll of paper and explained the symbols to me. Our job, as far as I could tell, was to extend the map northward. Denton had a surveying instrument mounted on a large wooden tripod and every so often he would take a reading from it and make inscriptions on the map.

The horses were heavily laden with equipment. In addition to large supplies of food and bedding we were each carrying a crossbow and bolts—there were some digging tools, a chemical-sampling kit, a miniature video camera and recording equipment. I was given the video kit to use and Denton showed me how to operate it.

The usual method of the Futures, as he explained it to me, was to send—over a period of time—a different surveyor or a different team of surveyors north of the city by different routes. By the end of the expedition each would have a detailed map of the terrain and a video record of its physical appearance. This would then be submitted to the council of Navigators and they, with the help of other surveyors' reports, would decide which route would be taken.

Toward late afternoon Denton stopped for about the sixth time and erected his tripod. After he had taken angular readings on the elevation of the surrounding hills and, by use of a gyroscopically mounted compass, had determined true north, he attached a free-swinging pendulum to the base of the instrument. The weight of the pendulum was pointed and when its natural momentum was spent and the pointer was stationary, Denton took a graduated scale marked with concentric circles and placed it between the legs of the tripod.

The pointer was almost exactly above the central mark.

"We're at optimum," he said. "Know what that means?"

"Not exactly."

"You've been down past, haven't

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you?" I confirmed this. "There's always centrifugal force to contend with on this world. The farther south one travels, the greater that force is. It's always present anywhere south of optimum, but it makes no practicable difference to normal operations for about twelve miles south of optimum. Farther than that the city would have real problems."

He took further readings from his instrument.

"Eight and a half miles," he said. "That's the distance between here and the city—or how much ground the city has to make up."

I asked, "How is the optimum measured?"

"By its null gravitational distortions. It serves as the standard by which we measure the city's progress. In physical terms, imagine it as a line drawn around the world."

"And the optimum is always moving?"

"No. The optimum is stationary—but the ground moves away from it."

"Oh, yes."

We packed our gear and continued north. Just before sunset we made camp for the night.

XXIV

The surveying work was mentally undemanding and as we traveled slowly northward I found that my only external preoccupation was the need to watch for signs of hostile inhabitants. Denton told me that an attack on us was unlikely—nevertheless we were on guard.

I found myself again thinking about the awesome experience of seeing the whole world lying before me. As an event, it was enough—understanding it was something else.

On our third day out from the city I suddenly started to consider the education I had been given as a child. I'm not sure what started the train of thought—possibly a random recollection of my recent shock at seeing how utterly the creche had been destroyed.

I had thought little of my education since leaving the creche. At the time I had felt, in common with most of the children in the creche, that the teaching we were given was not much more than a penance in which time was served out of necessity. But as I looked back, much of the education pushed into our unwilling heads took on a new dimension for me.

For instance, one of the subjects that had inspired in us the most boredom was what the teachers referred to as Geography. Most of these lessons had been concerned with the techniques of cartography and surveying—in the enclosed environment of the creche, such exercises had been almost wholly theoretical. Now, though, those hours of tedium took on their relevance at long last. With a little concentration and a certain amount of digging into my memory, I grasped quickly the principles of the work Denton was showing me.

We had had many other subjects taught to us theoretically and I saw now how those, too, had practical relevance. Any new guild apprentice would already have a back-

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ground knowledge of the work his own guild would expect him to do and, in addition, would have similar information about many of the other functions of the city.

Nothing could have prepared me for the sheer physical grind of working on the tracks, but I had had an almost instinctive understanding of the actual machinery used to haul the city along those tracks.

I had cared not at all for the compulsory training with the militia, but the puzzling—at the time—emphasis placed on military strategy during our education would clearly help men who later took arms for the security of the city.

This process of thought led me toward wondering whether there had been anything in my education that could possibly have prepared me for the sight of a world shaped the way this one appeared to be.

The lessons we had been given which specifically referred to astrophysics and astronomy had always spoken of planets as spheres. Earth—the planet, not our city—was described as an oblate spheroid and we had been shown maps of some of its land surface area. This aspect of physical science was not dwelled upon—I had grown up to assume that the world on which Earth city existed was a sphere like Earth planet and nothing I had been taught had contradicted this assumption. Indeed, the nature of the world had never been discussed overtly.

I knew that Earth planet was part of a system of planets orbiting a spherical sun. The planet itself was circled by a spherical satellite. This information seemed always to be theoretical—and this lack of practical application had not concerned me even when I left the city, for it was always clear that here a different circumstance obtained. The sun and moon were not spherical and neither was the world on which we lived.

The question remained—where were we?

The solution lay perhaps in the past.

THIS, too, had been covered comprehensively, although the histories we were taught were exclusively about Earth planet. Much of what we learned concerned military maneuvers, the transference of power and government from one state to another. We knew that time was measured in terms of years and centuries on Earth planet, that recorded history existed for about twenty centuries. Perhaps unfairly, I formed an impression that I should not care to live on Earth planet, as most of its existence seemed to be a series of disputes, wars, territorial claims, economic pressures. The concept of civilization was far advanced and explained to us as the state in which mankind congregated within cities. By definition, we of Earth city were civilized, but there seemed to be no resemblance between our existence and theirs. Civilization on Earth planet was equated with selfishness and greed—those people who lived in a civilized state exploited those who did not. There were shortages

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of vital commodities on Earth planet and the people in the civilized nations were able to monopolize those commodities by reason of their greater economic strength. This imbalance appeared to be at the root of the disputes.

I suddenly saw parallels between our civilization and theirs. The city was undoubtedly on a war footing as a result of the situation with the tooks—and that in its turn was a product of our barter system. We did not exploit them through wealth, but we had a surplus of the commodities in short supply among them—food, fuel energy, raw materials. Our shortage was manpower and we paid for that with our surplus commodities.

The process was inverted, but the product was the same.

Following my line of reasoning, I saw that the examination of the history of Earth planet prepared the way for those who would become Barter guildsmen, but it took me no further along my own search for understanding. The histories began and ended on Earth planet, with no mention of how the city came to be on this world, nor how the city had been built, nor about who its founders were and where they came from.

A deliberate omission? Or forgotten knowledge?

I imagined that many guildsmen had tried to construct their own patterns of logic and, for all I knew, either the answers were available somewhere in the city or there was a commonly accepted hypothesis which I had not yet encountered. But I had fallen naturally into the ways of the guildsmen. Survival on this world was a matter of initiative: on the grand scale, by hauling the city northward away from that zone of amazing distortion behind us, and on the personal scale of deriving for oneself a pattern of life that was self-determined. Future Denton was a self-sufficient man and so had been most of those I had met. I wanted to be one with them and comprehend things on my own account. I supposed that I could discuss my thoughts with Denton, but I chose not to.

THE journey northward was slow and meandering. We did not take a route due north, but followed many diversions to east and west. Periodically Denton would measure our position against optimum and never at any time were we farther north than about fifteen miles.

I asked him if there were any reason why we should not strike even farther north of optimum.

"Normally we would go as far north as we could," he said. "But the city's in a special circumstance. As well as seeking the easiest route, we need terrain that will allow us to defend ourselves."

The map we were compiling was becoming more complete and detailed every day. Denton allowed me to operate the equipment whenever I wished and soon I was as adept as he. I learned how to triangulate the land with the surveying instrument, how to estimate the elevation of hills and how to calculate our position relative to opti-

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mum. I was growing to like working the camera, in spite of the fact that, to conserve the energy in the batteries, I was forced to curb my enthusiasm.

It was peaceful and agreeable away from the tensions of the city and I discovered that Denton, in spite of his long silences, was an amiable and intelligent man.

I had lost track of the number of days we had been away, but it was certainly at least twenty. Denton showed no sign of wanting to return.

We encountered a small settlement nestling in a shallow valley. We made no attempt to approach it. Denton merely marked it on the map, with a rough estimate of its population.

The countryside was greener and fresher than that to which I had grown accustomed, although the sun was no cooler. It rained more often here, usually during the nights, and there were many different sizes of stream and river.

All the features of the region, natural or man-made, difficult for the city to pass through or suitable to its peculiar needs, Denton marked without comment on his map. It was not our job to decide which route the city should take—we worked simply to establish the actual nature of future terrain.

The atmosphere was restful and soporific, the natural beauty of our surroundings seductive. I knew the city would travel through this region in the miles to come and pass it without registering appreciation. For the city's aesthetics, this verdant and gentle countryside might as well be a windswept desert.

During the hours when I was not actually engaged in any of our routine tasks, I was still lost in speculative thought. I could not get out of my mind that spectacle of the manifest appearance of the world on which we existed. There must have been something, somewhere in those long years of tedious education, that should—subconsciously—have prepared me for that sight. We live by our assumptions—if one took for granted that the world one traveled across was like any other, could any education ever prepare one for a total reversal of that assumption?

The preparation for that sight had begun the day Future Denton had taken me outside the city for the first time, to see for myself a sun that revealed itself to be any shape but that of a sphere.

But I still felt there must have been an earlier clue.

I waited for a few more days, still worrying at the problem when I found time. Then I had an idea. Denton and I had camped one evening in open country beside a broad, shallow river. As sunset approached I took the video camera and recorder and walked alone up the side of a low hill about a half-mile away. From the top I had a clear view to the northeast.

As the sun neared the horizon the atmospheric haze dimmed its glare and its shape became visible: as ever, a broad disk spiked top and bottom. I switched on the camera and took a long shot of it. Then I replayed the tape, checking

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that the picture was clear and steady.

I had never tired of the spectacle. The sky was reddening—after the main disk had passed beneath the horizon the upright pinnacle of light slid quickly down. For a few minutes after its passing there was an impression of a bright focus of orange-white at the center of the red glow—but soon this passed and night came quickly on.

I played the tape again, watching the image of the sun on the recorder's tiny monitor. I froze the picture, then adjusted the brightness control, dimming the image until only the white shape remained.

There in miniature was an image of the world. My world. I had seen that shape before—long before leaving the confines of the creche. Those weird symmetrical curves made an overall pattern that someone had once shown me.

I stared at the monitor screen for a long time, then conscience struck me and I switched off to conserve the batteries. I did not return to camp immediately—I was straining my memory for some key to that faint recollection of the time when someone had drawn four lines on a sheet of card and held up for all to see the place where Earth city struggled to survive.

THE map that Denton and I were compiling was taking on a definite shape.

Drawn on the long roll of stiff paper he had brought, the plan took the form of a long, narrow funnel, its narrowest point at the patch of woodland a mile or so to the north of where the city had been when we left it. Our travels had all been within the funnel and had enabled us to make measurements of large features from all sides, to ensure that we compiled information as nearly accurate as possible.

When the work was finished Denton said that we would return at once to the city.

I had, in the video recorder, a complete and cross-referenced visual record of all the terrain we had covered. The Council of Navigators would examine as much as they felt necessary to plan the city's next route. Denton told me that other Futures would go north soon, draw another tunnel-map of the terrain. Perhaps it, too, would start at the patch of woodland and take a course five or ten degrees to east or west—or, if the Navigators felt that a safe route could be found in the terrain we had surveyed, the new map would start farther up the known territory and push forward again the frontier of the future we had surveyed.

We headed back toward the city. I had expected, in some melodramatic way, that now we had the information we had been sent to obtain, we would ride through day and night with no regard to safety or comfort—instead, the leisurely ride through the countryside continued.

"Shouldn't we hurry?" I asked finally, thinking that perhaps Denton was idling for some reason connected with me. I wished to show that I was willing to move with speed.

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"There's never any hurry up future," he said.

I didn't argue with him, but it had occurred to me that we had been away for at least thirty days. In that time the movement of the ground would have taken the city another three miles away from the optimum. It consequently would have had to travel at least that distance to stay within safety limits.

I knew that the unsurveyed territory began only a mile or so beyond the city's last position.

In short, the city would need the information we had.

THE return journey took three days. On the third day, as we loaded the horses and continued south, the memory I had been seeking came to me. It came unbidden, as is often the case when one is trying for something buried in the subconscious.

I felt I had exhausted all my conscious memories of my creche schooling. Sorting through my recollections of the long-academic courses had been as fruitless as the sessions had been tedious. Then, from a subject I had not even considered, the answer came.

I remembered a period in my last few miles inside the crèche—our teacher had taken us into the realms of calculus. All aspects of mathematics had induced the same response in me—I showed neither interest nor success—and this further development of abstract concepts had seemed no different.

The teaching had covered a kind of calculus known as functions and we were taught how to draw graphs representing these. It was the graphs that had provided the memory key. I had always had a moderate talent at drawing and for a few days my interest had flickered into life. It died almost immediately, for I discovered that the graphs were not an end in themselves but were drawn to provide a means of finding out more about the function—and I didn't know what a function was.

One graph in particular had been discussed in great and onerous detail.

It showed the curve of an equation where one value was represented as a reciprocal—or an inverse—of the other. The graph for this was a hyperbola. One part of the graph was drawn in the positive quadrant, one in the negative. Each end of the curve had an infinite value, both positive and negative.

The teacher had discussed what would happen if that graph were to be rotated about one of its axes. I had neither understood why graphs should be drawn, nor that one might rotate them and I'd suffered another attack of daydreaming. But I did notice that the teacher had drawn on a piece of large card what the solid body would look like should this rotation be performed.

The product was an impossible object: a solid with a disk of infinite radius and two hyperbolic spires above and below the disk, each of which narrowed toward an infinitely distant point.

It was a mathematical abstraction and held for me then as much interest as such an item should.

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But that mathematical impossibility was not taught to us without reason. In the indirect manner of all our education—on that day I had seen the shape of the world on which I lived.

XXV

DENTON and I rode through the woodland at the bottom of the range of hills—and there ahead of us was the pass.

Involuntarily I drew back on the reins and halted the horse.

"The city," I said. "Where is it?"

"Still by the river, I should imagine."

"Then it must have been destroyed—"

There could be no other explanation. If the city had not moved in all those thirty days, only another attack could have delayed it. By now it should have been in its new position in the pass.

Denton was watching me, an amused expression on his fase.

"Is this the first time you've been so far north of optimum?" he asked.

"Yes, it is."

"But you've been down past. What happened when you came back to the city?"

"An attack was going on—"

"Yes—but how much time had elapsed?"

"More than seventy miles."

"Was that more than you expected?"

"Yes. I thought I'd been gone only a few days—a mile or two in time."

"Okay." Denton moved forward again and I followed. "The opposite is true if you go north of optimum."

"What do you mean?"

"Hasn't anyone told you about the subjective time values?" My blank expression gave him the answer. "If you go anywhere south of optimum, subjective time is slowed. The farther south you go, the more that occurs. In the city the time scale is more or less normal while it is near the optimum, so that when you return from down past, it seems that the city has moved much farther than possible."

"But we've been north."

"Yes, and the effect is opposite. While we ride north our subjective time scale is speeded, so that the city appears not to have moved at all. From experience, I think you'll find that about four days have elapsed in the city while we've been gone. It's difficult to estimate at the moment, as the city itself is farther south of optimum than normal."

I said nothing for a few minutes. I was trying to understand the idea.

Then: "So if the city itself could move north of optimum, it wouldn't have so many miles to travel. It could stop."

"No. It always has to move."

"But if where we've been slows down time, the city would benefit from being there."

"No," he said again. "The differential in subjective time is relative."

"I don't understand," I said honestly.

We were now riding up the valley

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toward the pass. In a few minutes we would be able to see the city, if it was indeed where Denton had predicted.

"There are two factors. One is the movement of the ground. The other has to do with how one's values of time are changed subjectively. Both are absolute, but not necessarily connected as far as we know."

"Then why—"

"Listen. The ground moves physically. In the north it moves slowly—and the farther north one travels the more slowly it moves—in the south it moves faster. If it were possible to reach the most northern point we believe the ground would not move at all. On the other hand, we believe that in the south the movement accelerates to an infinite speed at the farthest extremity of the world."

I said, "I've been there—to the farthest extremity."

"You went—what? Forty miles? Perhaps more by accident? That was far enough for you to feel the effects—but only the beginnings of the real thing. We're talking in terms of millions of miles. Literally millions. Much more, some would say. Destaine thought the world was of infinite size."

"Destaine?"

"The city's founder."

I said, "But the city has only to travel a few miles farther, and it would be north of optimum."

"That's right—and it would make life a lot easier. We would still have to move the city, but not so often and not so far. But the problem is that it's as much as we can do to stay abreast of optimum."

"What is special about the optimum?"

"It's where conditions on this world are nearest to those on Earth planet. At the optimum point our subjective values for time are normal. In addition, a day lasts for twenty-four hours. Anywhere else on this world one's subjective time produces slightly longer or shorter days. The velocity of the ground at optimum is about one mile in every ten days. The optimum is important because on a world like this, where there are so many variables, we need a standard. Don't confuse miles-distance with miles-time. We say the city has moved so many miles when we really mean that ten times that number of twenty-four hour days have elapsed. So we would gain nothing in real terms by being north of optimum."

HE HAD now ridden to the highest point of the pass. Cable stays had been erected and the city was in the process of being winched. The militiamen were much in evidence, standing guard not only around the city itself but also at both sides of the tracks. We decided not to ride down to the city, but to wait near the stays until the winching was completed.

Denton asked suddenly, "Have you read Destaine's Directive?"

"No. I've heard of it. In the oath."

"That's right. Clausewitz has a copy. You ought to read it if you're a guildsman. Destaine laid down the rules for survival on this world

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and no one's ever seen any reason to change them. You'd understand the world a little better, I think."

"Did Destaine understand it?"

"I think so."

It took another hour for the winching to be completed. There was no intervention by the tooks and, in fact, there was no sign of them. I saw that several of the militiamen were now armed with rifles, presumably taken from the tooks killed in the last engagement.

When we went into the city I went straight to the central calendar and discovered that while we had been north three and a half days had elapsed.

THERE was a brief discussion with Clausewitz. Then we were taken to see Navigator McMahon. Denton and I described in some detail the terrain we had traveled through, pointing out the major physical features on our map. Denton outlined our suggestions for a route that the city should take, indicating features that might create problems and alternative routes around them. In fact, the terrain was in general suited to the city. The hills would mean several deviations from true north, but there were few steep inclines and overall the ground was some hundred feet lower at its northern point than the city's present elevation.

"We'll have two more surveys immediately," McMahon said to Clausewitz. "One five degrees to east and one five degrees to west. Do you have men available?"

"Yes, sir."

"I'll convene Council today and we'll set your provisional route for the time being. If better terrain appears from these two new surveys, we'll reconsider later. How soon will you be able to conduct a normal surveying pattern?"

"As soon as we can release men from militia and tracks," said Clausewitz.

"They're priorities. For the moment these surveys will have to suffice. If the situation eases, reapply."

"Yes, sir."

McMahon took our map and my video-tape and we left the Navigation chambers.

Outside, I said to Clausewitz: "Sir, I'd like to volunteer for one of the new surveys."

He shook his head. "No. You get three days' leave and then you go back to the Track guild."

"But—"

"Guild rules."

Clausewitz turned away and he and Denton walked toward the Futures' room. Technically that area was mine, too, but suddenly I felt excluded. Quite literally, I had nowhere to go. While I had been working outside the city I had been sleeping in one of the militia dormitories—now, officially on leave, I wasn't even sure where I lived. There were bunks in the Futures' room and I could sleep there for the moment, but I knew that I should see Victoria as soon as possible. I had been putting this off. I was still wondering how I could deal with the new situation with her and the answer to that lay in meeting her. I had a shower and changed my clothes.

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XXVI

NOTHING much had changed inside the city while I had been north. Domestic and Medical administrators were wholly preoccupied with looking after the wounded and reorganizing the city's accommodations. There was less sense of desperation in the faces of the people I saw and some efforts had been made to keep the corridors clear, but even so I realized that this was probably a bad moment to try to settle a domestic issue.

Victoria was difficult to trace. After several inquiries I was sent to a makeshift dormitory on the lowest level, but she was not there. I spoke to the woman in charge.

"You're her ex-husband, aren't you?"

"That's right. Where is she?"

"She doesn't want to see you. She's very busy. She'll contact you later."

"I want to see her," I said.

"You can't. Now, if you'll excuse me—we're very busy."

She turned her back to me and continued with her work. I glanced around the crowded dormitory. Off-shift workers slept at one end and several wounded were lying in rough beds at the other. A few people were moving between the beds, but Victoria was not among them.

I walked back to the Futures' room. During the time I had been looking for Victoria I had made a decision. There was no point in my hanging around the city aimlessly—I might as well go back to work on the tracks. But first I decided to read Clausewitz's copy of Destaine's Directive.

The Futures' room was empty but for one guildsman. He introduced himself to me as Future Blayne.

"You're Mann's son, aren't you?"

"Yes."

"Glad to see you. Have you been up future yet?"

"Yes," I said. I liked the look of Blayne. He was not much older than myself and he had a fresh, open face. He seemed glad to have someone to talk to—he was, he said, due to go north on one of the surveys later in the day and would be on his own for the next few miles.

"Do we often go north alone?" I asked.

"Normally, yes. We can work in pairs if Clausewitz gives his approval, but most Futures prefer to work alone. I like company myself—find it a bit lonely up there. How about you?"

"I've only been up future once. That was with Future Denton."

"How did you get along with him?"

And so we talked, amiably and without the usual guards that seemed to go up whenever I had talked to other guildsmen. I had unconsciously adopted this manner myself and at first I suppose I might have seemed diffident in his company. Within a few minutes, though, I found his forthright manner relaxing and soon I felt as if we were old friends.

I told him I had made a video

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recording of the sun.

"Did you wipe it?"

"What do you mean?"

"Erase it from the tape."

"No—should I have?"

HE LAUGHED. "You'll have the Navigators down on you if they see it. You're not supposed to use the tapes for anything except cross-referenced images of the terrain."

"Will they see it?"

"They might. If they're satisfied with the map they'll probably check a few cross-references. They're not likely to go through the whole tape. But if they do—"

"What's wrong with recording the sunset?"

"Guild rules. Tape is valuable and shouldn't be wasted. But don't worry about it. Why did you tape the sun, anyway?"

"An idea I had. I wanted to try to analyze it. It's an interesting shape."

He looked at me with new interest.

"What did you make of it?" he asked.

"Inverse values."

"That's right. How did you work it out? Did someone tell you?"

"I remembered something from the creche. A hyperbola."

"Have you thought it through yet? There's more to it than that. Have you thought about the surface area?"

"Future Denton was explaining. He said it was very large."

Blayne said, "Not very large—infinitely large. North of the city the surface curves up until it is almost, but never quite, vertical. South of the city it becomes almost but not quite horizontal. The world is spinning on its axis—and with an infinite radius it is spinning at infinite speed."

He delivered this flatly and without expression.

"You're joking," I said.

"I'm not. I'm perfectly serious. Where we are, near optimum, the effects of the spin are the same as they would be on Earth planet. Farther south, although the angular velocity is identical, the speed increases. Did you feel the centrifugal force when you were down past?"

"Yes."

"If you'd gone farther you wouldn't be here now to remember it. That force is bloody real."

"I was told," I said, "that nothing could travel faster than the speed of light."

"That's true. Nothing does. In theory the world's circumference is infinitely long and moves at infinite speed. But there is, or there is considered to be, a point where matter ceases to exist and serves as an effective circumference. That point is where the spinning of the world imparts a velocity on the matter equivalent to the speed of light."

"So it's not infinite."

"Not quite. But bloody big. Look at the sun."

"I have," I said. "Often."

"That's the same. If it wasn't spinning it would be—literally—infinitely large."

I said, "Even so, in theory it is that large. How can there be room

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for more than one object of infinite size?"

"There's an answer to that. You won't like it."

"Try me."

"Go to the library and find one of the astronomical books. It doesn't matter which. They're all Earth planet books, so they all have the same assumptions. If we were now on Earth planet we would be living in a universe of infinite size, which would be occupied by a number of large, but finite, bodies. Here the inverse is the rule: we live in a large but finite universe, occupied by a number of bodies of infinite size."

"It doesn't make sense."

"I know," said Blayne. "I said you wouldn't like it."

"Where are we?"

"No one knows."

"Where is Earth planet?"

"No one knows that either."

I said, "Down past something strange happened. I was with three girls. As we went south, their bodies changed. They—"

"Did you see anyone up future?"

"No. We kept away from the villages."

"North of optimum the local people change physically. They become very tall and thin. The farther north we travel, the more the physical factors change."

"I've only been about fifteen miles north."

"Then you probably wouldn't have noticed anything peculiar. Farther than thirty-five miles north of optimum, everything is very strange."

Later I asked, "Why does the ground move?"

"I'm not sure," said Blayne.

"Is anyone?"

"No."

"Where is it moving to?"

"More to the point," said Blayne, "where is it moving *from?*"

"Do you know?"

"Destaine said that the movement of the ground was cyclic. He says in his Directive that the ground is actually stationary at the north pole. Farther south, it is moving very slowly toward the equator. The nearer it approaches to the equator the faster it moves, both angularly—because of the rotation—and linearly. At the farthest extreme it is moving in two directions at once at infinite speed."

I stared at him. "But—"

"Wait—I haven't finished. The world has a southern part, too. If this world were a sphere that part would be called a hemisphere, so Destaine adopted the term for convenience. In the southern hemisphere the opposite is true. That is, the ground moves from the equator toward the south pole, steadily decelerating. At the south pole it is stationary again."

"You still haven't said where the ground moves from."

"Destaine suggested that north and south poles were identical. In other words, once any point on the ground reaches the south pole it reappears at the north pole."

"That's impossible!"

"Not according to Destaine. He says that the world is shaped like a solid hyperbola—that is, all limits are infinite. If you can imagine

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that, the limits adopt the characteristics of their opposite value. An infinite negative becomes an infinite positive—and vice-versa."

"Are you quoting him verbatim?"

"I think so. But you should read the original."

"I intend to," I said.

Before Blayne left the city to go north, we agreed that when the crisis outside the city was settled we would ride together.

ONCE more alone, I read through the copy of Destaine's Directive that Blayne obtained for me from Clausewitz.

It consisted of several pages of closely printed text, much of which would have been incomprehensible to me had I read it when I had first ventured outside the city. Now, with my own ideas and experiences added to what Blayne had said, it served only to confirm. I saw some of the sense of the guild system—experience had laid the way to understanding.

Much of the Directive consisted of theoretical mathematics interspersed with profuse calculations—at these I glanced only briefly. Of more interest was what appeared to be a hurried journal. Some sections caught my attention deeply.

> We are a long way from Earth. Our home planet is one I doubt we shall ever see again, but if we are to survive here we must maintain ourselves as a microcosm of Earth. We are in desolation and isolation. All around us is a hostile world that daily threatens our survival. As long as our buildings remain, so long shall man survive in this place. Protection and preservation of our home is paramount.

Later he wrote:

> I have measured the rate of regression at one-tenth of a statute mile in a period of twenty-three hours and forty-seven minutes. Although this southward drift is slow it is relentless—the establishment shall therefore be moved at least one mile in every ten-day period.
>
> Nothing must stand in the way. We have already encountered one river and it was crossed at great hazard. Doubtless we shall encounter further obstacles in the days and miles ahead, and by then we must be ready. We must concentrate on finding some indigenous materials that can be stored permanently within the buildings for later use in construction. A bridge should not be too difficult to build if we have enough warning.
>
> Sturner has been forward and warns of a marshy region some miles ahead. Already we have sent other teams to northeast and northwest to determine the extent of this marsh. If it is not too wide we can deviate from due north for a time and make up the

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necessary difference later.

Following this entry were two pages of the theory Blayne had tried to explain to me. I read it through twice and each time it made slightly better sense. I left it and read on.

> Chen has provided the inventory of fissionable materials I requested. All of it waste! With the translat-generator, no more need!
>
> Said nothing to L. I enjoy the arguments with him—why curtail them now? Future generations will be warm!
>
> Today's outside temperature: -23°C. Still we move north.

Later:

> Trouble with one of the caterpillar tracks. T. has advised me to authorize stripping them. Says that Sturner reports from the north that he has found what appears to be the remains of a railway line. Some incredible scheme to run the establishment along the tracks somehow. T. says it would work okay.

Later:

> Decided to create a guild system. Pleasant archaism that everyone approves. A way of structuring the organization without drastically changing the way the place is run, but I think it might impose a form to the establishment that will survive us all.
>
> Caterpillar track stripping proceeding well. Has caused a long delay. Hope we can catch up.
>
> Natasha gave birth today: boy.
>
> Doctor S. gave me some more pills. Says I'm working too hard and have to rest. Later, maybe.

Toward the end of the Directive, a more didactic tone emerged:

> What I have written here shall be privy only to those who venture outside—no need for those inside the establishment to be reminded of our dreadful prospects. We are organized enough: we have sufficient mechanical power and human initiative to maintain us safely in this world forever. Those who follow must learn the hard way of what will happen if we fail to exploit either our power or our initiative and this knowledge will suffice to keep both working to the maximum.
>
> Someone from Earth must find us one day, God willing. Until then our maxim is survival *at any cost.*
>
> From now, it has been agreed and is hereby directed:
>
> That the ultimate responsibility lies in the hands of the Council. These men shall navigate the establishment, and be known as Navigators. Their number, which shall at

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no time fall below twelve, shall be elected from the senior members of the following guilds:

Track Guild: Who shall be responsible for the maintenance of the railway along which the establishment runs;

Traction Guild: Who shall be responsible for the maintenance of the motive power of the establishment;

Future Guild: Who shall be responsible for surveying the lands that lie in future time of our establishment;

Bridge Builders Guild: Who shall be responsible for safe conduct over physical obstacles, should no other way be available.

Further, should it be necessary to create other guilds in the future, no guild may be created except by unanimous vote of the Council.

(signed)
Francis Destaine

THE major bulk of the Directive consisted of short entries dated in a sequence that ran from 23rd February 1987 and concluded on 19th August 2023. The final signed statement was dated 24th August 2023.

There were two final sheets. One was a codicil, marking the formation of the Barter Guild and the Militia Guild. These were undated. The other sheet was a graph drawn by hand. It showed the hyperbola produced by the equation $y = 1/x$, and beneath it were some mathematical signs, which I could not understand.

Such was Destaine's Directive.

XXVII

OUTSIDE the city work on the tracks was proceeding well.

When I joined the track crews most of the rail now behind the city had been taken up. Other crews were already relaying them from the head of the pass down the long shallow valley. The atmosphere had improved—helped, I think, by the successful and undisturbed winching of the city away from the river. The gradient for the next section was in our favor. The cables and stays would have to be used, because the gradient was not sufficiently steep to overcome the effects of the centrifugal force that could be felt even here.

It was a strange sensation to stand on the ground beside the city and see it stretching out in each direction in an overall horizontal way. I knew now that this apparent levelness was no such thing; at optimum, which on the vast scale of this world was not substantially distant, the ground was actually tilted at a full forty-five degree gradient toward north. Was this, though, any different from living on the surface of a spherical world like Earth planet? I remembered a book I had read in the creche, a book written in and about a place called England. The book had been written for young children and described the life of a family planning to emigrate to a place called Australia. The children in the book had

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believed that where they were going they would be upside down and the author had gone to some pains to describe how all points on a sphere appeared to be 'upright' because of gravitational effects. So it was on this world. I had been both north and south of optimum and always the ground appeared to be level.

I enjoyed the labor on the tracks. It was good once more to be using my body and not give myself time to think.

But one loose end remained stubbornly untied: Victoria.

I needed to see her, however distasteful such an interview might be, and I wanted to settle the situation soon. Until I had spoken to her, whatever the outcome, I would not feel at ease in the city.

I was now settled in my acceptance of the physical environment of the city. Very few questions remained to be answered. I understood how and why the city was moved and was aware of the many subtle dangers that lay in wait should it ever cease its northward journey. I knew that the city was vulnerable and, at this very time, in imminent danger, but I felt its problems would be resolved soon.

But no external considerations could settle my personal crisis—I had become alienated from a girl I had loved in the space of what seemed to me to be a few days.

As a guildsman, I discovered, I was allowed to attend meetings of the Council of Navigators. I could not take an active part, but no aspect of the session was closed to me as a spectator.

I was told that a meeting was to be held and decided to attend it.

The Navigators met in a small hall set just behind the main Navigation quarters. The session was disarmingly informal. I had anticipated much ceremony and air of occasion, but the fact was that these meetings were crucial to the efficient operation of the whole city and a businesslike air dominated the proceedings from the moment the Navigators came into the chamber and took their seats around a table.

Two Navigators I knew by name, Olsson and McMahon, were present and thirteen others.

The first matter to be discussed was the military situation outside. One of the Navigators stood up, introduced himself as Navigator Thorens and gave a succinct report of the current situation.

The militia had established that there were still at least a hundred tooks in the neighborhood of the city and most of them were armed. According to military intelligence, their morale was low as a result of many losses. This contrasted sharply, the Navigator said, with the morale of our troops, who felt they could contain any further development. They were now in possession of twenty-one captured rifles and although there was not much ammunition, some had been captured and the Traction guild had devised a method of manufacturing small quantities.

A second Navigator confirmed Thorens' facts.

The next report was on the condition of the city's structure.

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There was considerable discussion about how much rebuilding should be carried out and how soon. It was stated that there was pressure on the Domestic administrators and that sleeping accommodation was at a premium. The Navigators agreed that a new dormitory block should be given priority.

This discussion led naturally into wider issues and these were of great interest to me.

As far as I could tell, the views of the Navigators present were divided. One school of thought was of the opinion that the previous "closed-city" policy should be reintroduced as soon as possible. The others thought that it had outlived its purpose and should be permanently abandoned.

It seemed to me that this was a crucial issue, one that could radically alter the social structure of the city—and indeed, this was the undercurrent of the discussion. Doing away with the closed system would mean that anyone growing up in the city would gradually learn the truth about the city's situation. It would mean a new way of education and would bring subtle changes in the powers of the guilds themselves.

In the end, after many calls for votes and several amendments, there was a show of hands. By a majority of one it was decided not to reintroduce the closed-city system for the time being.

More revelations followed. It transpired from the next item that there were seventeen transferred women inside the city, who had been there since before the first attack by the tooks. There was some discussion about what should be done with them. The meeting was informed that the women had said they wished to stay in the city—and it was immediately clear that it was possible that the attacks had been made in an attempt to free the women.

Another vote: the women would be allowed to stay within the city for as long as they wished.

It was also decided not to reintroduce the down past initiative test for apprentices. I understood that this had been suspended after the first attack and several Navigators were in favor of now bringing it back. The meeting was told that twelve apprentices were known to have been killed down past and another five were unaccounted for. The suspension remained for the time being.

I was fascinated by what I heard. I hadn't realized before the extent to which the Navigators were in touch with the practicalities of the system. Nothing specific had been said, but there was a general feeling among some of the guildsmen that the Navigators were a group of aging fuddyduddies out of touch with reality. Advanced in years some of them certainly were, but their perceptions had not faded. Looking around at the mostly empty guild seats, I reflected that perhaps more guildsmen should attend the Navigators' meetings.

THERE was more business to deal with. The report that Denton and I had made of the terrain to the

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north was presented by Navigator McMahon, with the added information that two other surveys were presently being conducted and that the results would be known within a day or two.

The meeting agreed that the city should follow the provisional route marked by Denton and myself until any better route was devised.

Finally the subject of the city's traction was raised by Navigator Lucan. He said that the Traction guild had come up with a scheme for moving the city slightly faster. Regaining ground on optimum would be a major step toward returning the city to a normal situation, he argued, and there was agreement to this.

The proposal, he said, was for the city to be put onto a continuous-traction schedule. This would involve a greater liaison with the Track guild and perhaps a greater risk of cable break. But he argued that as we were now short of much valuable rail stock, after the burning of the bridge, the city would have to make shorter hauls. The Traction guild's suggestion was to maintain a shorter length of track actually laid to the north of the city and to keep the winches running permanently. They would be phased out for periodic overhaul, and as the gradients of future territory were largely in our favor we could keep the city running at a speed sufficient to bring us back to optimum within twenty or twenty-five miles of elapsed time.

There were few objections to this scheme, although the chairman called for a detailed report. When the vote was cast the result was nine in favour, six against. The city would transfer to continuous running as soon as could be managed.

XXVIII

I WAS due to leave the city for a survey mission to the north. In the morning I had been called away from my work on the tracks and Clausewitz had given me my briefing. I would leave the city the next day and travel twenty-five miles to the north of optimum, reporting back on the nature of the terrain and the positions of various settlements. I was given the choice of working alone or with another Future guildsman. Recalling the new and welcome acquaintanceship with Blayne, I requested that he and I work together and this was granted.

I was eager to leave. I felt no obligation to remain on the manual work of the tracks. Men who had never been outside the city were working well as teams and more progress was made than at any time we had employed local labor.

The last attack by the tooks now seemed a long way behind us and morale was good. We had made it to the pass in safety—ahead was the long slope through the valley. The weather was fine and hopes were high.

IN THE evening I returned to the city. I had decided to talk over the survey mission with Blayne and spend the night in the Futures' quarters. We would be ready to

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leave at first light.

Walking through the corridors, I glanced into an open doorway and saw Victoria.

She was working alone in a tiny office, checking through a large batch of papers. I went in and closed the door behind me.

"Oh, it's you," she said.

"You don't mind?"

"I'm very busy."

"So am I."

"Then leave me alone and get on with whatever it is."

"No," I said. "I want to talk to you."

"Some other time."

"You can't avoid me forever."

"I don't have to talk to you now," she said.

I grabbed at her pen, knocking it from her hand. Papers fell to the floor and she gasped.

"What happened, Victoria? Why didn't you wait for me?"

She stared down at the scattered papers and made no answer.

"Come on—tell me."

"It was a long time ago. Does it still matter to you?"

"Yes."

She was looking at me now and I stared back at her. She had changed a lot and seemed older. She was more assured, more her own woman—but I could recognize the familiar way she held her head, the way her hands were clenched: half a fist, two fingers erect and interfolded.

"Helward, I'm sorry if you were hurt, but I've been through a lot, too. Will that do?"

"You know it won't. What about all the things we talked about?"

"Such as?"

"The private things, the intimacies."

"Your oath is safe. You needn't worry about that."

"I wasn't even thinking of it," I said. "What about the other things, about you and me?"

"The whispered exchanges in bed?"

I winced. "Yes."

"They were a long time ago." Perhaps my reaction showed, for suddenly her manner softened. "I'm sorry. I didn't mean to be callous."

"Okay. Say what you like."

"No—it's just that—I wasn't expecting to see you. You were gone so long! You could have been dead and no one would tell me anything."

"Whom did you ask?"

"Your boss. Clausewitz. All he'd say was that you'd left the city."

"But I told you where I was going. I said I had to go south."

"And you said you'd be back in a few miles' time."

"I know," I said. "I was wrong."

"What happened?"

"I—was delayed." I couldn't even begin to explain.

"That's all? You were delayed?"

"IT was a lot farther than I thought."

She began shuffling her papers aimlessly, making them into a semblance of a tidy pile. But she was just working her hands—I had broken through.

"You never saw David, did you?"

"David? Is that what you called him?"

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"He was—" She looked up at me again and her eyes were brimming with tears. "I had to put him in the creche—there was so much work to do. I saw him every day and then the first attack came. I had to be on a fire point, and couldn't— Later we went down to the—"

I closed my eyes, turned away. She put her face in her hands, started to cry. I leaned against the wall, resting my face against my forearm. A few seconds later I started to cry, too.

A woman came through the door quickly, saw what was happening. She closed the door again. This time I leaned my weight against it to prevent further interruptions.

LATER Victoria said, "I thought you would never come back. There was a lot of confusion in the city, but I managed to find someone from your guild. He said that a lot of apprentices had been killed when they were in the south. I told him how long you had been gone. He wouldn't commit himself. All I knew was how long you'd been gone and when you had said you'd be back. You were away nearly two years, Helward."

"I was warned," I said. "But I didn't believe the warning."

"Why not?"

"I had to walk a distance of about eighty miles—there and back. I thought I could do it in a few days. No one in the guild told me why I couldn't."

"But they knew?"

"Undoubtedly."

"They could have at least waited until we'd had the child."

"I had to go when I was told. It was part of the guild training."

Victoria was now more composed than before—the emotional reaction had completely destroyed any antipathy between us and we were able to talk more rationally. She picked up the fallen papers, arranged them into a pile, then put them away into a drawer. There was a chair by the opposite wall and I sat in it.

"You know the guild system is going to have to change," she said.

"Not drastically."

"It's going to break down completely. It has to. In effect it's happened already. Anyone can go outside the city now. The Navigators will cling to the old system for as long as they can because they're living in the past, but—"

"They're not as hidebound as you think," I said.

"They'll try to bring back the secrecy and the suppression as soon as they can."

"You're wrong," I said flatly. "I know you're wrong."

"All right—but certain things will have to change. There's no one in the city now who doesn't know the danger we're in. We've been cheating and stealing our way across this land and that has created the danger. It's time for it to stop."

"Victoria, you don't—"

"You only have to look at the damage! There were thirty-nine children killed! God knows how much destruction. Do you think we can survive if the people outside keep on attacking us?"

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"The situation is quieter now. It's under control."

She shook her head. "I don't care what the current situation looks like. I'm thinking about the long term. All our troubles are ultimately created by the city's being moved. That one condition produces the danger. We move across other peoples' land. We bargain for manpower to move the city. We take women into the city to have sex with men they hardly know—and all in the effort of keeping the city moving."

"The city can never stop," I said.

"You see—you are already a part of the guild system. Always the system gives us this flat statement, without looking at it in a wider light. The city must move, the city must move. Don't accept it as an absolute."

"It is an absolute. I know what would happen if the city stopped."

"Well?"

"It would be destroyed and everyone woudl be killed."

"You can't prove that."

"No—but I know it would be so."

"I think you're wrong," said Victoria. "And I'm not alone. Even in the last few days I've heard it said by others. People can think for themselves. They've been outside, seen what it's like. There's no danger apart from the danger we create for ourselves."

I said, "Look, this isn't our conflict. I wanted to see you to talk about us."

"But it's all the same. What happened to us is implicitly bound up in the ways of the city. If you hadn't been a guildsman we might still be living together."

"Is there any chance—"

"Do you want it?"

"I'm not sure," I said.

"It's impossible. For me, at least. I couldn't reconcile what I believe with accepting your way of life. We've tried it and it separated us. Anyway, I'm living with—"

"I know."

She looked at me and I felt at second hand the alienation she had experienced.

"Don't you have any beliefs, Helward?" she said.

"Only that the guild system, for all its imperfections, is sound."

"And you want us to live together again, living out two separate beliefs. It couldn't work."

We had both changed a lot—she was right. It was no good speculating about what might have been in other circumstances. There was no way of making a personal relationship distinct from the overall scheme of the city.

Even so, I tried again, attempting to articulate the apparent suddenness of what had happened, attempting to find a formula that could somehow revive the early feelings we had had for each other. To be fair, Victoria responded in kind, but I think we had both arrived at the same conclusion by our separate routes. I felt better for seeing her and when I left her and walked toward the Futures' quarters I was aware that we had succeeded in resolving the worst of the remaining issue.

TO BE CONCLUDED

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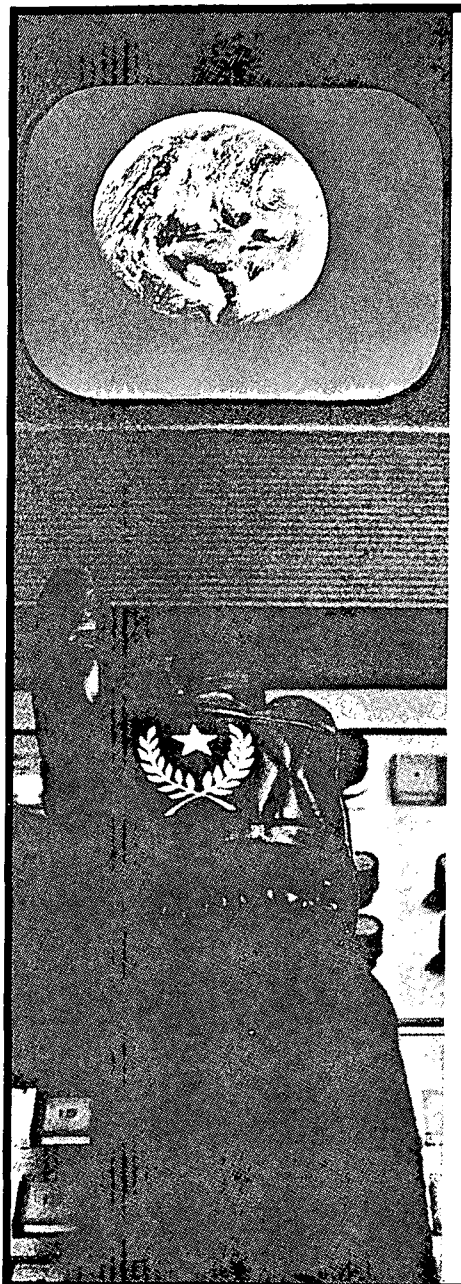

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